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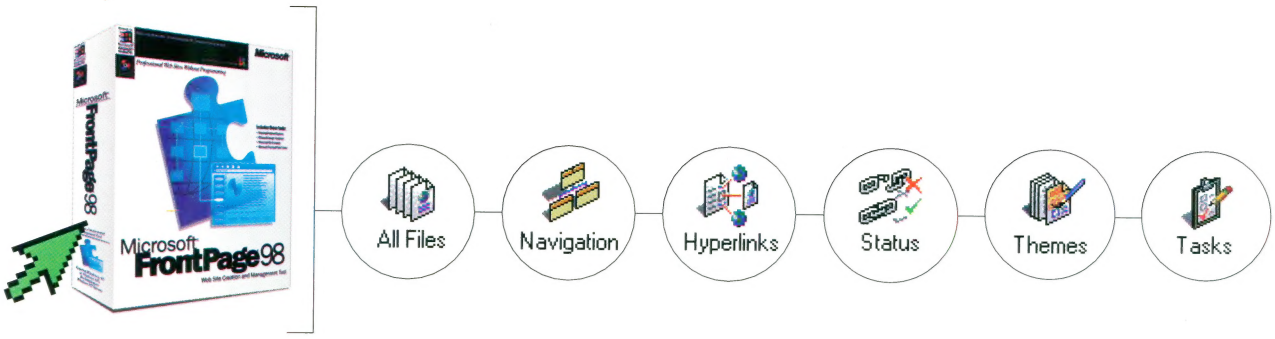
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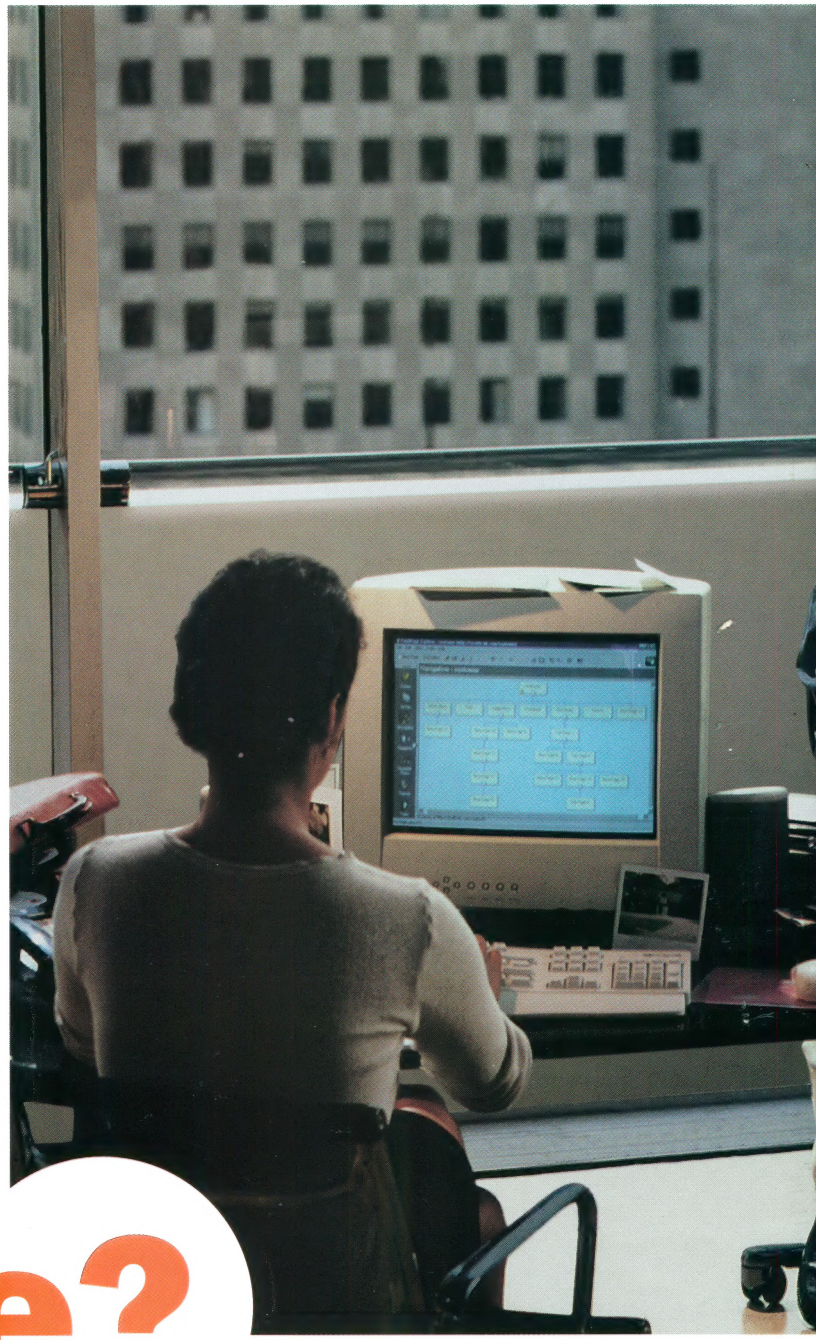


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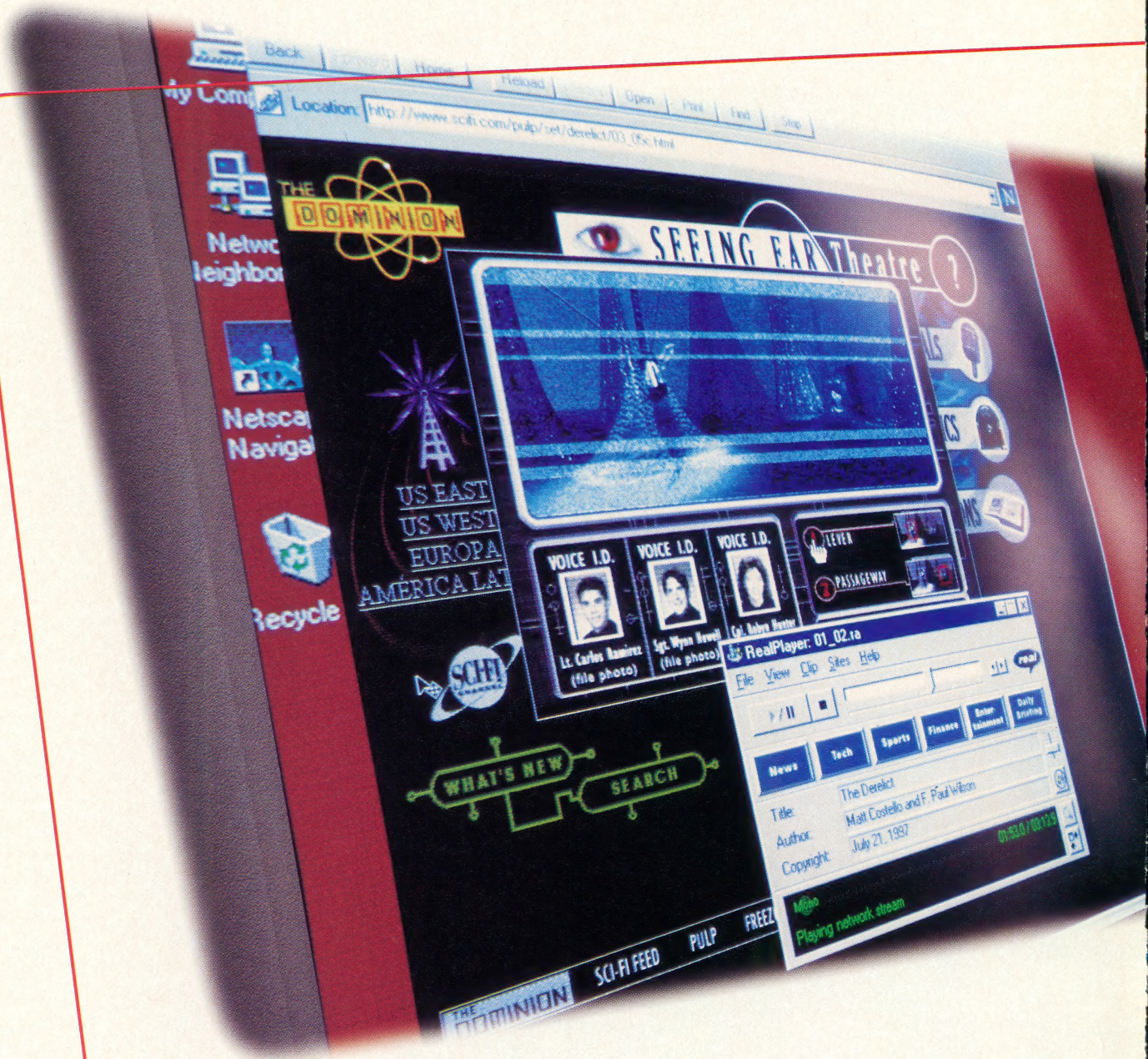
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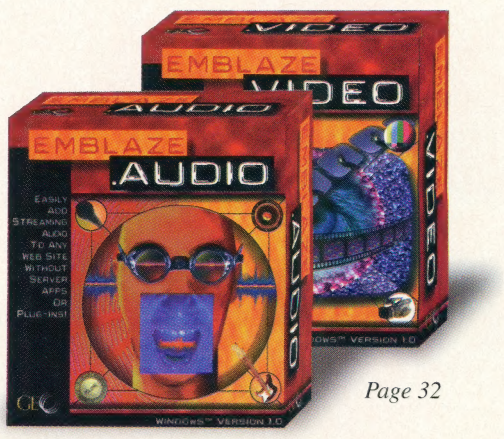
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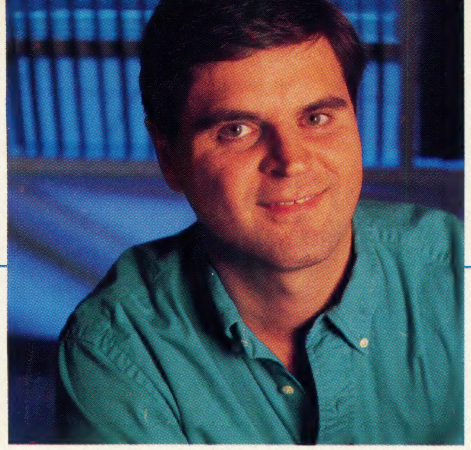
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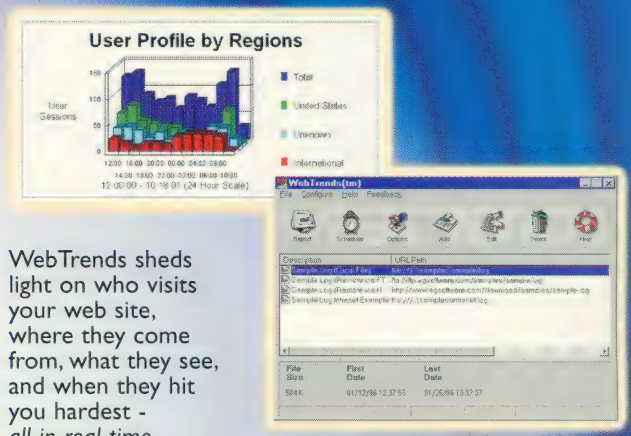
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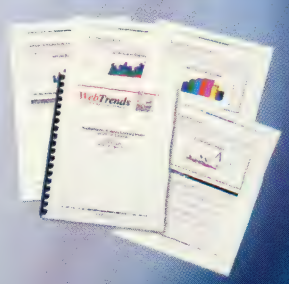
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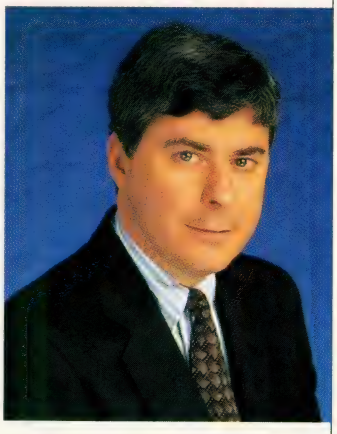
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CIRCLE NUMBER 49

Killing the Goose

ARE WE ABOUT TO WITNESS THE LONG, DRAWN-OUT DEATH OF E-MAIL? I hate to think it might be true, but the signs of bad health can't be ignored. E-mail cuts through barriers of time, distance, and social strata. It can help people work together who normally couldn't. And it helps people find information in a way that was impossible before.

But Internet e-mail is struggling. Junk marketing is undermining the medium's effectiveness just as we were about to see some of the technology's challenges solved. As the report on e-mail servers in this issue by Nelson King explains, e-mail servers are starting to provide a level of control over messages and addresses that will make it easier to find people and to manage our mail.



Direct marketers are drawn to e-mail campaigns because the cost is lower than any sales effort ever conceived. To get a message in front of 500,000 people, you'd spend several thousand dollars whether you printed flyers, bought advertising space in a publication, or air time on a radio station. It's a temptation that many brain-dead hucksters can't resist.

Just this morning, my inbox contained a request for a dollar from a man in Idaho who said he was fed up with his job; a survey asking for my opinions on Mexican avocados; and an offer to begin a direct e-mail campaign on my behalf that would cost only $150 to send out 500,000 e-mails. (Three different copies of this last one arrived; apparently the sender is as sloppy as he is shameless.)

As Jim Evans found in this issue's cover story, "E-Mail Overload," many marketers believe there is virtually no cost to sending e-mail.

And that's the problem. Bulk e-mail costs are not borne by the marketers, they're borne by the Internet Service Providers (ISPs) who must store and forward those messages on their servers. Unlike printed direct mail, sent through the postal system, ISPs do not charge for every piece they move. Internet e-mail works only because ISPs can cover their business costs by collecting subscription revenue. Since ISPs are not going to be able to raise their subscriber rates any time soon, they're now caught in the middle.

A few are fighting back. Agis, which had been widely criticized for allowing bulk e-mailers to use its services, canceled the account of the largest offender. The reason: Agis' servers were attacked by anti-spammers.

EarthLink Networks, which says it cancels the accounts of about 130 small-time spammers every week, went to court to stop one of the larger companies from using its servers. EarthLink won a court order and anticipates a trial on the issue will be held in Los Angeles Superior Court soon.

Unless we get the problem under control, the danger is that e-mail will never reach its full potential. The Net's power lies in its ability to give us the information we want. E-mail about products and services we can use would be welcome, if it was relevant. But as millions begin to ignore e-mail from people they don't know, that potential begins to die.

We're becoming anesthetized to unsolicited e-mail. I recently came close to deleting a message titled "just saying hi" because it looked like a typical come-on from a dim-witted scammer. Fortunately for me, I'm more likely than the typical user to read every message and was pleasantly surprised to find that it was an old college friend. It's sad to contemplate how many innocent queries are being zapped before the connection is made. Just recently, a new company, PowerAgent, that planned to help marketers find consumers who truly were interested in their products by creating "opt-in" e-mail lists, was forced to lay off most of its staff.

The Internet has the potential to transform business and e-mail is one of its most promising tools. But until we figure out how to fix the spam problem, we'll be losing far more real opportunities than the latest batch of "income opportunity" messages will ever deliver.

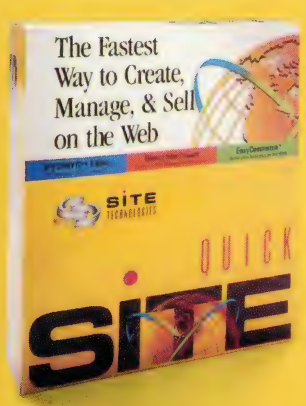


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CIRCLE NUMBER 25

Letters to the Editor

NO RESPECT

In Gus Venditto's editorial ("Signs of Life From Apple," Oct. *IW*) he claims that Mac products don't get reviewed often because there isn't any software in the reviewed category for the Mac or because it falls far behind. He must be talking about *very* specialized software, or he just hasn't looked very hard. I use a Mac for all my Web-page development, and there isn't *one* piece of software I haven't been able to find.

THOMAS REED
ThomasReed@aol.com

MACS DID PAVE THE ROAD

I am responding to Gus Venditto's editorial in October's *Internet World*. He says many readers believe he held back coverage on the Macintosh platform. I was disappointed with his reply, which was: "You don't have to spend much time on the Web to know that Mac developers have not been paving the road to the future." Not only is this a silly statement, but an ignorant one. Windows users would not have had tools that they are currently using to develop Web sites without Macintosh developers porting their applications over to the Windows platform. And with the advent of the Microsoft investment into Apple, Microsoft will have an arsenal it could only have dreamt of at its hands for development.

ROBERT J. MILLER
landing@landingpad.com

While it's true the Mac version of important graphics applications like Photoshop and PageMill were out first a few years ago, that's not the trend today. As I noted, the Mac platform is still the preferred platform of a large number of Web-site developers, but it's not the platform targeted by software developers. Whether it's browser plug-ins or general applications like e-mail, the Windows version is out before the Mac version 9 times out of 10.

—Gus Venditto

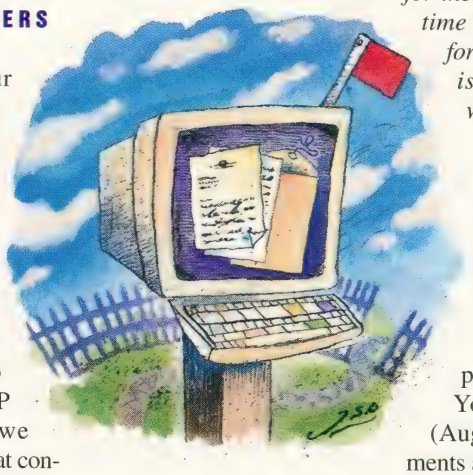
OS/2 DOES IT TOO

In "Signs of Life from Apple" (Oct. *IW*), Gus Venditto says "Apple has folded a Java virtual machine into Mac OS8," and "The new operating system comes with a small utility, Applet Runner, that can launch any Java applet without using a browser."

OS/2 4.0 has been doing this for around a year now. *Internet World* may ignore Apple users, but they also all but deny that OS/2 even exists. If IBM promoted it more, I think we would see OS/2 mentioned much more in all computing/Internet magazines.

GREG DEUERLING
gad@inil.com

MIRRORED SERVERS SOLVE IT



In "Protecting Your Name" (Bottom Line, Oct. *IW*) The tone of the article suggests that simply having two remote DNS servers will somehow ensure fewer headaches concerning your (or your client's) Web presence if your ISP goes down. First we have to determine what constitutes a Web presence. A happy DNS with a downed Web server does not a connection make. Would your clients be happier if they got a "server not responding" message instead of "no domain name"? Not likely. Even though Snyder's solution eliminates some overhead, it still requires considerable downtime, which for some clients is absolutely unacceptable. The only real solution for serious business is mirrored Web servers in disparate locations as well as name servers. All it takes is cash.

ED CRELIN
ecrelin@macinsight.com

ISPs AND FRONTPAGE: A HAPPY COUPLE?

I enjoyed your review of FrontPage 98 (IW Reviews, Oct. *IW*), as I use FrontPage 97, but you should spend more time warning people about the pitfalls of using FrontPage to write a Web page that will be posted on an ISP. I have never found an ISP that will install the Microsoft extensions needed to use all of FrontPage's features.

FrontPage is obviously designed for Webmasters and not for the rest of us. It also costs too much.

DEL JENSON
deljen@snake.srv.net

Your experience is the opposite of mine: The Web-hosting services and ISPs I use already have installed FrontPage extensions and, in fact, advertise that fact to attract new clients.

But you must be reading our minds. We're working on a roundup of Web-hosting services with the small- to medium-sized businesses in mind—folks who need a Web presence, but may not have the budget for their own server or full-time Webmaster. Support for FrontPage extensions is one of the aspects we'll be looking at.

—David D. Busch

ART WORTH 1,000 WORDS

Congratulations and admiration to Jonathan Barkat, whose profound painting illustrated "Is Your Network Safe" (Aug. *IW*). And compliments also to *Internet World* for supporting fine art that carries serious metaphors that deserve our contemplation.

BEN BLUMENBERG
bennett@pipeline.com

YOU SERVE IT, THEY'LL HOST IT

"Hosting Your Own Chat" by Kevin Reichard (Oct. *IW*) recommends chat for lots of good reasons and we applaud that because chat will soon become the number one way people send time on the Internet.

For your readers who want to offer Chat but not host it on their server, we have a free program called Chat@Talk City that allows users to create community chat for their Web sites. Since the program began in June 1997, over 10,000 Chat@Talk City rooms have opened.

PETER FRIEDMAN
CEO, TALK CITY
friedman@liveworld.com

A SEARCH WITH RELEVANCE

While I enjoyed David Haskin's overview of the various well-known search services on the Web ("Special Report," http://www.iw.com) I found his primary metric "number of pages returned" to be too simplistic.

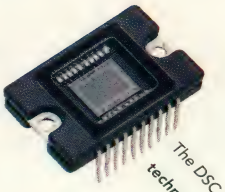
The goal is to find not only a volume of resources but also relevant and timely information. AltaVista, for example, houses millions of pages which have expired, become outdated, or simply vanished from

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SONY

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the Web. It is necessary to purge the database of "cobwebs" from time to time in order to present the searcher with useful hits. In this regard the article correctly lauds HotBot's "last-modified" feature.

KARL GEIGER
kgeiger@amgen.com

A SALUTE TO CABLE MODEMS

In your October news story, "In a Race to Deliver Faster Access, DSL Leads," your correspondent seems to be ill-informed about cable modems. I have been using cable modems from MediaOne in the Boston area for more than a year. They are relatively inexpensive, reliable, widely available and have many subscribers.

ISDN on the other hand is a big hassle and far slower, and DSL has yet to materialize and is technologically unproven on a large scale. Clearly, cable modems are the leading high-speed Internet access solution for the immediate future.

BRENT COCHRAN
cochran@opal.tufts.edu

MY VISION OF THE FUTURE

I read "Whose Name Is It, Anyway?" (Aug. *IW*) about the naming scheme of Internet Web sites. How will a naming scheme allow the Internet to mature? My vision is that a good naming scheme will deliver a sense of ownership. An organization's Web site could become part of a group, and the members of specific groups could manage the access to their site to ensure that they reach their target audience. It may be necessary to develop specialized "group browsers" which permit access to these specific groups.

Some groups will want to reside on particular servers and others on another type. Then Internet evolution will take its course.

ROBERT LAFRAMBOISE
e-mail withheld

COOKIE DEBATE ISN'T OVER

I'd like to respond to Jason Korzen's letter (Letters, Sept. *IW*) and his attitude about those of us who are unappreciative of his cookies and their invasiveness of our computers and lives. One site can't read another site's cookie? Nonsense. That's entirely up to the writers of the cookies. Indeed, a cookie, like any other piece of programming, will do only what it's been written to do.

Cookies are not needed for shopping carts; that's just a cop-out. Vendors can store my pending purchase information on their own machines—and most do.

ERIC HINES
ehines@zianet.com

NEWS FROM THE FRONT

I've been reading *Internet World* for over a year and continue to be impressed with each issue. Keep up the good work reporting from the forefront of Web development.

JIM TATE
jimtate@worldnet.att.net

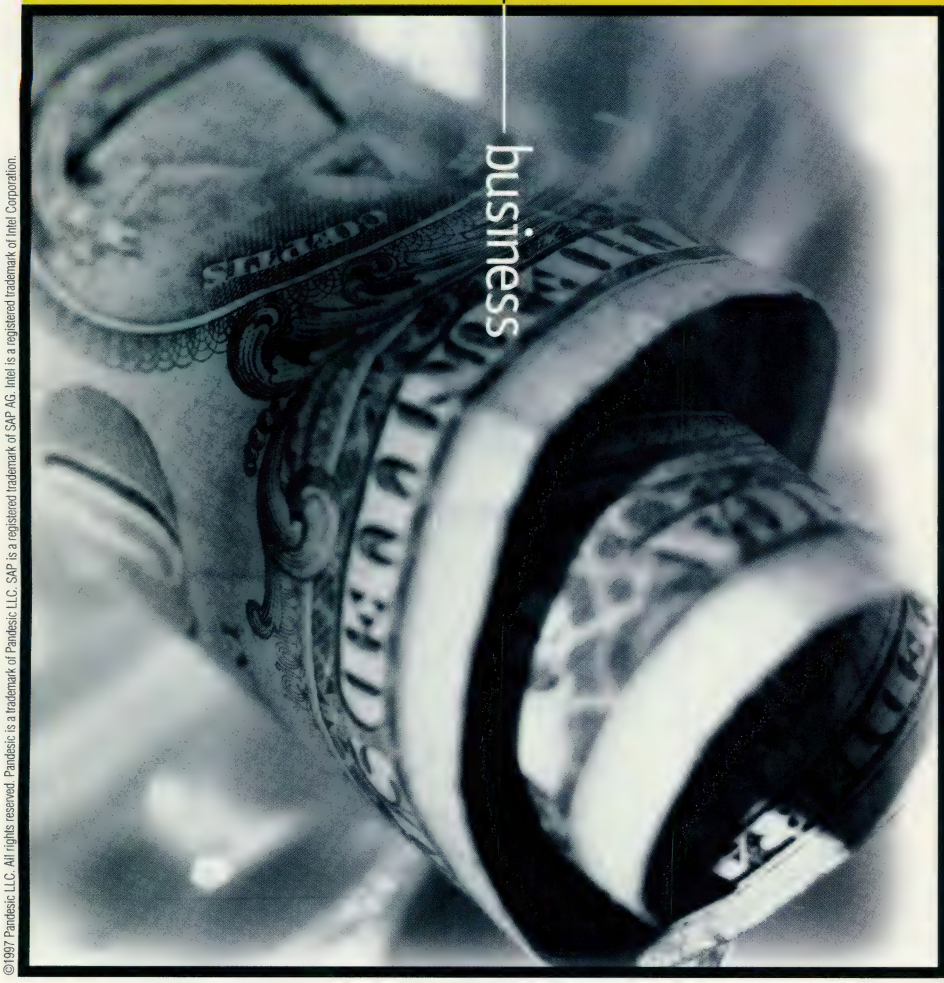
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CIRCLE NUMBER 12

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CIRCLE NUMBER 83

News

Edited by Amy Dunlop

ON AND ABOUT THE NET

FRAUD

Hidden Tags Leading to Court Battles

Web designers have long exploited the <META> tag in the hope of pushing their sites to the top of search-engine results. The tags work behind the scenes, providing a "keyword" that is read by search engines to give a relevancy ranking. A site that carries a keyword is more likely to be displayed higher when a user looks for its term.

But the technique is now leading to heated court battles. Success with innocent uses of meta tags has led some Web-page designers to insert words for popular topics even though they are irrelevant to the site. A few have resorted to listing their competitors' names as a shrewd means of diverting customers. The practice has been compared to calling the 411 telephone directory to get the listing of Apple Computer, only to receive the number for Microsoft.

Larry Chase, president of Chase Online Marketing Strategies in New York, says such misrepresentation has become so commonplace that search engines now are keenly alert for meta-tag fraud. Excite, for example, ignores meta tags. "I heard that a major airline was putting 'sex' in its meta tags to attract traffic," Chase says. "But the search-engine companies catch this stuff. Some search engines will boot your site out of its database if you're abusing the search."

Yet the raised consciousness of the search engines isn't enough to console some victims of meta-tag exploitation. Three federal law suits have been filed since July, accusing Webmasters of trademark infringement or unfair competition.

In the first, *Insituform Technologies Inc. v. National Envirotech Group*, filed in Louisiana, Insituform accused its construction rival of including "insituform" and "insitupipe" in its meta tags. In August the judge settled the case, issuing a permanent restraining order against National Envirotech from using Insituform trademarks.



Lawyer Carl Oppedahl predicts that more and more Web-site owners will be forced to defend their trademarks against meta-tag marauders.

In the second suit, *Oppedahl & Larson v. Advanced Concepts*, lawyer Carl Oppedahl accused Advanced Concepts, an ISP that offers domain-name registration services, of unfair competition for including "Oppedahl" and "Larson," the name of his Colorado law firm, in its meta tags. Advanced Concepts removed the keywords. "We've had past problems that we resolved with letters," he says. "But we got tired of it and decided to get serious, so hopefully this will discourage people from taking things from us." He predicts that the controversy will lead to closer scrutiny of meta tags—and more lawsuits.

The third case, *Playboy Enterprises Inc. v. Calvin Designer Label*, filed in California, saw Playboy at first objecting to a company selling sexual fantasies from Web sites with the names playboyxxx.com and playmatelive.com. On closer inspection, Playboy discovered its trademarks also being used in the culprit's meta tags. The court ordered the sites to stop infringing Playboy's trademark and both sites were closed.

Kevin Lee, chief operating officer of Did-it.com Inc., a New York Web-promotion service, says the search industry already is moving away from meta tags in favor of indexing actual content on a page, so innovation may preclude legal action. He added that fraudulent meta tags were unnecessary and reveal either laziness or ignorance by the page creator.

Kevin Lee Thomason agreed. The president of TSW Ltd., a Web-page designer in San Francisco, says meta tags are useful mainly in graphics-heavy sites that have few words. "You must have something for the search engines to see," he says. "But engaging in tricks suggests the site is so thin in content that it has to cheat." —*James Evans*



TV prompts some sites to redesign. 22

Yahoo! wins popularity contest. 24



George Gilder on the real value of Java. 30

Photograph by Larry Thomas

ACCESS

Gateway2000 Becomes ISP

Revamping its business model and embracing the Internet, Gateway2000 plans to sell Internet access along with computers. The hardware manufacturer has begun shipping PCs with US Robotics' 56K x2 modems and Internet Explorer 3.0. Because Gateway is preconfiguring each system for its own toll-free dial-up number, a new computer owner will need only to locate his or her phone jack to connect instantly.

"Having your customers online is a tremendous strategic advantage," says Dan Marovitz, Gateway's Global Web Manager. "We know where they are. It's to our advantage to make sure that our customers have a positive online experience." The company has set a competitive pricing structure: $12.95 for 30 hours, $2.95 an hour after that. It is also guaranteeing a 99 percent first-try connection rate and will serve its customers through one superPOP, rather than hundreds of local POPs. People who already own Gateway computers will be offered the service by year's end.

Gateway's vision extends beyond connectivity to providing a "family friendly" start page, hosting users' personal Web sites, and providing HTML templates for those sites. "We want to think of ourselves as a content aggregator," says Marovitz. "We'll be serving as a clearinghouse for what's good on the Web."

Gateway grew by sidestepping retail stores and selling directly to customers. The fact that it is now creating its own Internet access service is a sign of how effective the Web has become as a way for businesses to reach consumers.

—Amy Dunlop

InterNIC Expands Domain-Name Support

Ten service providers have been added to Network Solutions' Premier Domain Registration Program. The companies are given a direct connection to the InterNIC, which means they are able to ensure all new domain registrations and modifications within one business day, global updates within two days, and around-the-clock account services. Current Premier providers are:

- Adgrafix
- Advanced Web Creations
- America.net
- AOL PrimeHost
- CompuServe
- Concentric Network
- Digex
- Digitel Services
- EarthLink Network
- Erol's Internet
- Hiway Technologies
- HomeCom
- IMC Online
- Internet Servers Inc.
- Internet Quality Services
- MCI
- MindSpring
- NameSecure
- Netcom
- NetCorps
- NetNames
- NetNation
- Northwest Nexus
- Pair Networks
- Primenet
- SuperNet Inc.
- T3West
- TABNet
- TIAC
- ValueWeb
- VPOP

OPEN FOR BROWSING

The Andover News Network launched several sites for IT professionals: AppleWatch, HardwareWatch, InternetWatch, ITWatch, JavaWatch, MicrosoftWatch, NetscapeWatch, SoftwareWatch, and TelcoWatch. Each offers hourly



updated news from *InfoWorld*, TechWire, *Computerworld*, *Web Week*, and others (http://www.andovernews.com).

Netscape's NetCenter is positioning itself as a starting point for business professionals. Features include Software Depot and Virtual Office, where companies can set up private intranets and discussion groups. Users must register and get a digital certificate (http://www.netscape.com).

SNAP! Online is a new content aggregator from CNET. Providers for the 13 information channels include CBS SportsLine, CNN, E! Online, Motley Fool, and MSNBC, with content ranging from money to dining out (http://www.snap.com).

The Compendium of HTML Elements describes all HTML tags, what they do, and how the Navigator and Explorer browsers recognize them differently (http://www.htmlcompendium.org).

Knight-Ridder Information's Crossroads offers twice-monthly forums for discussion in technology-related subjects such as telecommunications and how to use patents to track emerging technologies (http://crossroads.krinfo.com).

WebCrawler has reformatted its content into channels so people can search by category. New services also include free e-mail, instant-messaging apps, chat, and bulletin boards (http://www.webcrawler.com).

SmartMoney Interactive offers a portfolio tracker, Dow Jones



news, and hourly stock updates for $49 per year or $29 for *Smart Money* or *WSJ* subscribers (http://www.smartmoney.com).

—Susie Davis

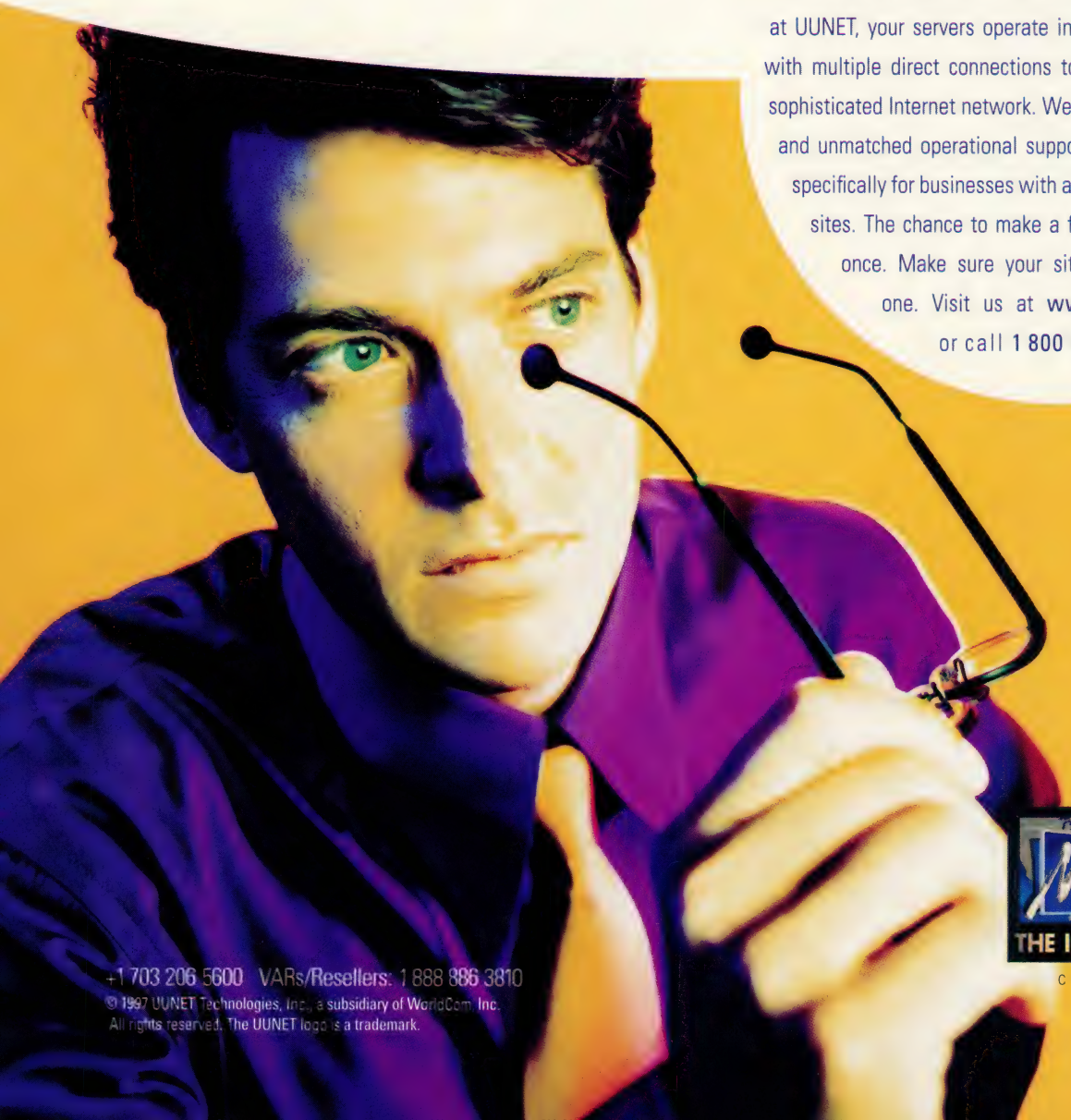
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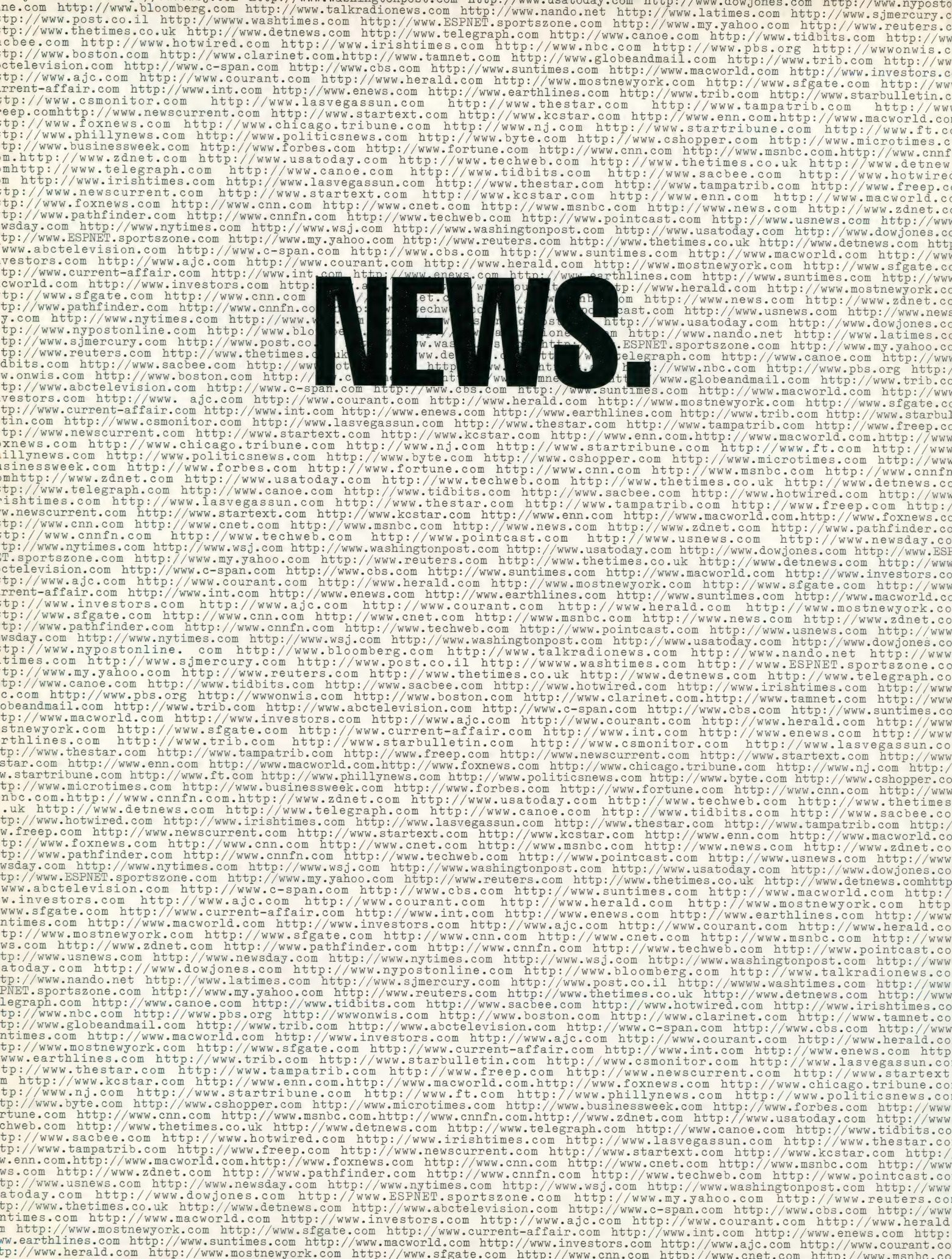


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CIRCLE NUMBER 4


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SITE DESIGN

WebTV Forcing Sites to Revamp Design

Debate rages over whether Net access through TVs will ever represent a significant share of overall access, but the first generation of Web televisions—including those from Hitachi, Magnavox, Mitsubishi, RCA, and Sony—is already having an impact. While WebTV, which is licensed by Sony and others, dominates early sales, RCA and others market a different Net-enabled TV. A number of sites eager to reach mass audiences have altered their designs to look better on TV tubes.



Net-enabled TVs use their own browsers stored in hardware ROM and connect to special gateway servers that render Web pages into a format that works better on a TV screen than ordinary Web pages. Sites that take the time to create TV-specific pages will look best on television's comparatively low-resolution display.

The main tenets of site design for TV screens are to use toned-down colors (no more than 90 percent saturated); fit the presentation inside a 544x378-pixel viewing area; use light text against a dark background wherever possible; and keep the layout *simple*.

20th Century Fox, Castle Rock Entertainment, and Virgin Records have all modified their sites to accommodate WebTV viewers. According to Patrick Bradley, COO at Zentropy Interactive, the Los Angeles Web-development firm that created these sites, on occasions up to 40 percent of their visitor traffic can come from WebTV. "Television viewers provide favorable demographics for the entertainment industry, and that fact more than any perceived critical mass of WebTV viewers motivated these companies to adapt their sites to WebTV," he says.

John Barnhill, CEO of Silicon Reef, a San Francisco Web-development firm that is working on a smart-card-enabled WebTV site for Glendale Federal Bank in Southern California, advises clients to get into Web television early to put themselves into a good position to exploit the market. "A sampling last spring showed that about 30 percent of the audience for the popular Webby Awards, a WebTV-enhanced Web site developed by Silicon Reef, were WebTV viewers," claims Barnhill.

Silicon Reef has adapted several clients' sites to use fewer colors, preload Web pages, use Flash animation, and take advantage of WebTV's audio capabilities for playing MIDI and RealAudio background music. Silicon Reef's designs use a browser sniffer to identify clients and then use a database to deliver a custom combination of static Web pages and pages generated on the fly.

Zentropy used toned-down colors and broadcast-display standards to ensure a good look for its clients. Bradley says, "We strive to make the Web experience as much like television as possible to appeal to WebTV viewers. That means generous use of motion such as Flash animation. In the future, as technology advances, we will certainly use video clips." So far Zentropy has not had to create entirely separate Web sites for different types of access, but it is prepared to do so if necessary—as others have. "We haven't found that the WebTV system restricts our creativity, although any system has limitations which must be observed," says Bradley. Shockwave and other popular plug-ins, for example, are not supported.

The path to final designs did not come without some headaches, though. Bradley was initially unhappy with WebTV for its lack of a practical way to test Zentropy's work before deploying it. WebTV now makes that simulator available to all developers who join its Prime Time developer program.

—Joseph T. Sinclair

REGULATION

Gambling Ban May Slip By

The Interactive Gaming Council expects online gambling to grow to $10 billion by 2000, but none of those gamblers will be Americans, if several members of Congress have their way.

Rep. Bob Goodlatte (R-Va.) called the Internet "a challenge to the sovereignty of civilized communities," as he introduced the Internet Gambling Prohibition Act of 1997. Both Goodlatte and Sen. Jon Kyl (R-Ariz.), sponsor of the Senate version of the bill introduced last spring, say the act is a top priority and hope to see it passed by year's end. At press time, the bill remained on hold in the Senate Judiciary Committee.

The Act calls for a $2,500 fine and up to six months in prison for the casual bettor, while casino operators could face a $20,000 fine and four years in prison.

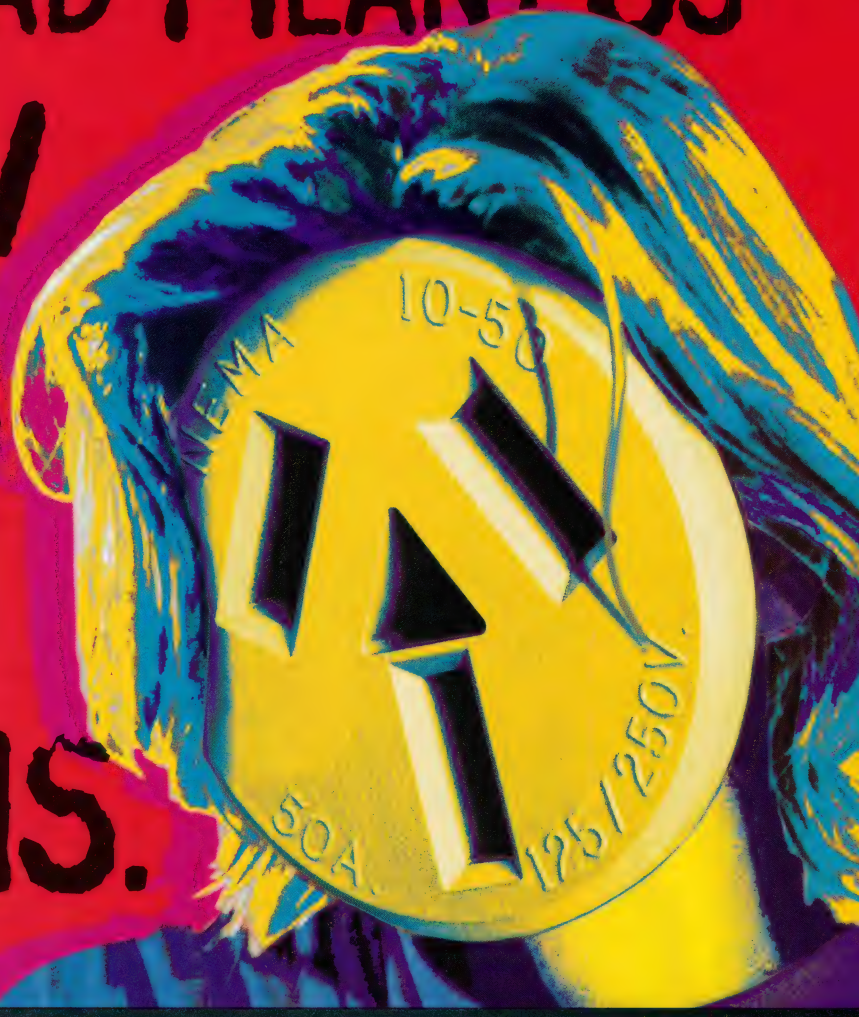
The online-gambling industry sees this as another government attempt to ban something it doesn't understand. "There are ways to regulate problems," says James Lucier, director of economic research at Americans for Tax Reform, "but not with a federal sledgehammer." Gaming experts expect casino operators will simply continue to set up shop outside the United States.

Sue Schneider, chairman of the Interactive Gaming Council, points to regulations in New Zealand and Australia permitting online gambling as a possible framework for U.S. law. Schneider anticipates that by year's end a minimum of 60 sites will offer live wagering. Her organization is setting up an accreditation process for online casinos.

Aside from those directly involved, the Internet industry has remained silent. "The industry is so focused on Internet taxation and encryption, gambling [prohibition] can slip right through because no one's paying attention," says Lucier.

—Vira Mamchur Schwartz

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CIRCLE NUMBER 133

Junk E-Mail Showdown

Leading advocates on both sides of the spam issue will debate publicly on December 10 at the Internet World conference in New York. Sanford Wallace, president of Cyber Promotions Inc., often credited with creating unsolicited commercial e-mail (UCE), will argue his case against Jason Catlett, founder of Junkbusters Corp. Wallace is involved in several civil suits that aim to restrict his company's direct e-mailings. Catlett is advocating federal legislation that will place restrictions on bulk e-mailers. For details, see the show schedule at http://www.internet.com.

DEMOGRAPHICS

Yahoo! Wins on New Ratings

Competition among leading Web sites is fierce, with dozens of sites now getting millions of hits a day. But unlike more mature media markets, the Web does not yet have a broadly accepted rating system to verify claims of hit superiority.

RelevantKnowledge is now vying for that job. It is projecting the number of unique visitors to a site using a system that tracks real-time paths of specific users. The users are selected to provide demographic groups covering age, income, gender, location, and frequency; desktop software monitors their Net browsing. The following results cover the month of August 1997; visits to multiple domains associated with a site were consolidated (signified by *). —*A.D.*

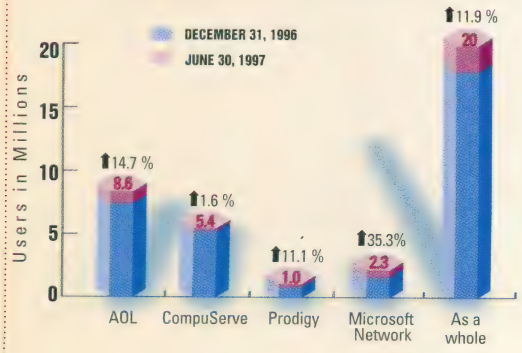
1.	Yahoo!	14,822,302
2.	Microsoft*	12,012,202
3.	Netscape	10,824,802
4.	AOL	8,251,103
5.	Infoseek	7,946,467
6.	Excite*	7,597,988
7.	Geocities	7,127,869
8.	MSN*	6,170,267
9.	Lycos*	4,883,459
10.	AltaVista	4,657,826
11.	CNET*	3,976,232
12.	ZDNet*	3,521,996
13.	WebCrawler	3,233,339
14.	RealAudio	2,260,248
15.	Four11	2,202,307
16.	Pathfinder	2,129,904
17.	Hotmail*	1,936,296
18.	ESPN	1,931,467
19.	Tripod	1,754,563
20.	CompuServe	1,720,862

VITAL SIGNS

NETSCAPE EASILY WINNING BROWSER WAR

Netscape isn't suffering from Microsoft's free Internet Explorer distribution and bundling agreements. Computer Intelligence says Netscape holds 71 percent of the browser market and Microsoft 14 percent. Forrester Research puts Netscape at 75 percent while Dataquest estimates 85 percent (both putting Microsoft and AOL's browser at under 10 percent each).

ONLINE SERVICES STEADILY GAIN CUSTOMERS



AMERICANS ARE GETTING WIRED FAST

About 51 million U.S. adults (16 and over) were online as of Q2 this year and an additional 8.5 million intend to get online before the end of the year. Females account for 47 percent of users (compared with 36 percent a year ago), and they make up 58 percent of those who intend to get online in the future. (IntelliQuest Information Group)

REGISTERED DOMAINS ARE GROWING BY LEAPS AND BOUNDS

	July 31, 1996	Jan. 31, 1997	July 31, 1997
.com	3,323,647	3,965,417	4,501,039
.edu	2,114,851	2,654,129	2,942,714
.net	1,232,902	1,548,575	2,164,815
.org	327,148	313,204	434,654

(Network Wizards)

CENSORSHIP IS NO. 1 HOT TOPIC

What's the most important issue facing the Internet today? 36 percent say it's censorship, 26 percent say privacy, and 13 percent say navigation. Considered least important are cultural and language issues, with under 2 percent reporting in each category. (Graphic, Visualization, & Usability Center's [GVU] 7th WWW User Survey)

DO YOU PURPOSELY GIVE THE WRONG INFORMATION?

About 40 percent of Internet users have provided false information to a site when registering in the last year. About 14.6 percent of users will falsify registration information more than 25 percent percent of the time. A larger percentage of males than females will intentionally supply the wrong data (44 percent versus 32 percent). (GVU's 7th WWW User Survey)

ONLINE TRADING IS BOOMING

Online stock trades accounted for about 30 percent of all discount-brokerage trading by the end of the year (about $628 million), a number that will rise to about 60 percent by 2001 and help discount brokerages eat into the market share of traditional full-service brokers. Garnering the largest share is Charles Schwab (35 percent of all online trades), Fidelity (27 percent), and E*Trade (13 percent). (Piper Jaffray) —*A.D.*

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Information Request Form	Available
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CIRCLE NUMBER 111

DEALMAKERS

In a complicated exchange that reshapes the online-services industry, **AOL** is acquiring **CompuServe Online Services** and its 2.6 million subscribers from **WorldCom**, which purchased the division from **H&R Block**. In exchange, WorldCom is acquiring AOL's networking division, **ANS Communications**. WorldCom's subsidiary, **UUNET**, will become AOL's largest network service provider. CompuServe will continue to be run as an individual brand. The transaction total is about $425 million • **MindSpring** acquired **Delphi**'s 1,100 dial-up Internet subscribers as well as the accounts of five regional ISPs, bringing its ISP acquisitions this year to 20 • **Apple Computer** bought **Power Computing**, the leading maker of Macintosh clones, for $100 million • **The Integrion Financial Network**, a consortium of banks led by **IBM**, intends to strengthen its online banking services through the purchase of **Visa Interactive**, a subsidiary of **Visa International**. The purchase brings an end-to-end bill-payment solution and Visa's ePay electronic-payment service into Integrion's fold • **Sun Microsystems** will buy **Integrity Arts**, a maker of virtual-machine and operating-systems technology for smart cards. Integrity employees will become part of Sun's JavaSoft division in order to boost the Java Card platform • **Alcatel**, **Nortel**, and **Samsung** say they will use **Sun Microsystems**' PersonalJava platforms in their Web phones for downloading data such as e-mail and Web pages from a network • **Panasonic** announced it will use **Unwired Planet**'s HDML-based microbrowser in its phones so users can access network information • **Alcatel**, **Ericsson**, **Nokia**, and **Siemens** all agreed to use GSM data technology, a wideband system for global mobile communications. The move signals conversion to third-generation wireless technology • Open Financial Exchange (OFX), the financial-data transfer platform from **Microsoft**, **Intuit**, and **CheckFree**, will be used by **Charles Schwab** so customers can manage their portfolios online using Microsoft Investor • Continuing its efforts to catch up to bookseller **Amazon.com**, **Barnes & Noble** launched an Affiliate Network of 40 sites that will co-market books and receive commissions on purchases. Affiliates include **CNN Interactive**, **CondeNet**, **Internet.com**, **Lycos**, and **USA Today**. —*A.D.*

MARKETING

Java Fuels New Ads

Online ads are taking the first steps beyond hyperlinking, with a new ad generation using Java to deliver complete applications at Web sites.

An early leader is Narrative Communications, whose Enliven system can create fully interactive animated ads. New Balance used Enliven to ask questions about users' athletic habits and shoe preferences, then displayed selected styles—all within the banner and without requiring the user to click away from the site where the ad appeared. Enliven uses a Java client and its own server to deliver the applications, which can be created in Macromedia Director.



This kind of "nested" ad content, which tries to engage a viewer within the confines of the banner ad, is on the rise. "The biggest problem with banner ads is that people don't feel like clicking away," says Don Senerath of Digital Pulp, who has developed Nano-Site, a Java-based banner ad that delivers multiple "nano-pages" and streaming media within the banner space. Nano-Site is used on sites run by Individual Investor Online, DoubleClick, and BizTravel.

First Virtual Holdings is taking ads to the next logical level: transactions. With its VirtualTAG banners, users can make credit card purchases within the banner while First Virtual processes the back-end transaction. VirtualTAG is available but no one has yet used it for online selling.

EchoMedia is accommodating TV-advertising models on the Net. "We're trying to bring their TV ads to the Net," says Monique Gulati Burgess of EchoMedia, whose Java-based Sesame-Ad system converts TV ads into Web-capable software files. Sesame-Ads then take advantage of download wait time to pop up a separate, small advertising window to play the commercial. Sandals Resorts is a charter advertiser. Sesame-Ad also tries to duplicate the detailed viewer tracking that TV advertisers are used to, including time of day and time zone. Burgess envisions a future when advertisers will make time-zone buys on the Net.

Dave Zinman, co-founder of Focalink, a maker of Web-advertising products, points out that the cost to support these new technologies can be prohibitive to a site. "But it's the *promise* of Java and embedded HTML that is fueling experimentation," he says. Focalink found that Java is running at only 17 percent of the sites it surveyed, with Shockwave at 14 percent and embedded HTML at 2 percent.

Zinman says, "Marketers are experimenting before they've even determined that it's the optimal technology for their message. I don't think anyone understands what all this technology *could* mean." —*A.D.*

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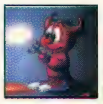
With BSDI Internet Server 3.0, a single PC server can deliver over 43 million Web hits per day and easily saturate a 45 million bps T3 line. BSDI 3.0's new graphical MaxIM Internet management tool makes it easy to install, configure, and maintain Internet services. Advanced service protection features help you protect your site from denial-of-service attacks. BSDI 3.0 includes commerce-ready Netscape FastTrack and Apache Web servers, Software.com's Post.Office and BSD's sendmail E-mail servers, powerful servers for FTP, Netnews, NFS, and Telnet, the htmlscript development environment, Raima's Velocis database, and more!

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E-COMMERCE

Search Engines Plan Massive Shopping Malls



With millions of users passing through their links every day, the leading search engines have seen themselves as the Internet's major intersections for some time.

In a natural evolution, Excite, HotBot, Infoseek, and Yahoo! are now erecting major shopping malls on their Web real estate. Each search engine will have shopper's directories and may also link to consumer information and resources. The competitive sites are hoping to differentiate their malls with unique blends of services.

Excite is offering "consumer protection" within its stores by promising to pay the $50 deductible a credit card company charges if a card number is stolen during a transaction. Security experts see Excite's actual risk as minimal, since the transactions will be encrypted.

HotBot plans to feature a small number of "premier" retailers. And Yahoo! is branching out into online commerce via its relationship with Visa, establishing the "Visa Shopping Guide by Yahoo."

Infoseek plans a system where shoppers register their mailing information and credit card number once with Infoseek, so whenever they buy from Infoseek's merchants they won't need to input their personal data.

What's fueling this trend? Spokesmen for the companies say that the search engines are reacting to what Internet users are interested in and generating a market for. Leo Jolicoeur of Infoseek says that the search engines are realizing they have "the ability to vertically integrate. We have the audience and content; the next layer is transaction capability." The money to be made here extends beyond banner-ad revenue to slotting fees and, given the ease with which sites can track where the user is clicking in from, commissions to the referring search site. *—Heidi Brumbaugh*

COMPETITION

ISPs Compete by Sweetening the Offer

Ever wonder *exactly* what's slowing down your connection? That's one question that EarthLink is answering for its customers with Net.Medic from VitalSigns. The software, provided free to EarthLink customers, lets each member monitor their own real-time Internet path and see bottlenecks via a "dashboard" of icons and graphs. Net.Medic is just one of a smorgasbord of services the ISP hopes will attract and retain customers.

Across the board, ISPs are finding it necessary to pile on value-added services to stay competitive. Web-site hosting, automatic reconnect, access to news servers, "guaranteed connectivity," and 24-by-7 tech support are some of the more common carrots being dangled today.

Hong Chen, CEO of AimQuest in Milpitas, Calif., sees the marketplace becoming cutthroat. "They *have to* offer more value-added services such as global roaming, remote access, faxing, telephony, and maybe videoconferencing in the future to increase the revenue per subscriber." AimQuest is getting in on the action with its Global Reach Internet Connection (GRIC) service, an alliance of ISPs working together to provide global roaming, so customers of member ISPs will have a local Internet dial-up number anywhere they might travel.

Another popular convenience is a customized home page. EarthLink, for example, is offering personal start pages that include personalized reminders, Snap! channels, e-mail, and "favorites" links.

Businesses that pay for direct access are being offered tools to control access charges. Epoch Internet offers metered T-1 service, so users are charged only for the bandwidth they actually use (calculated by megabits transferred). And a number of ISPs offer Web log-analysis services for tracking site hits. Customers of ISPs using Bazaar Analyzer Pro/vider from Aquas can buy detailed reports of their site usage, from automatically generated reports to real-time interactive views.

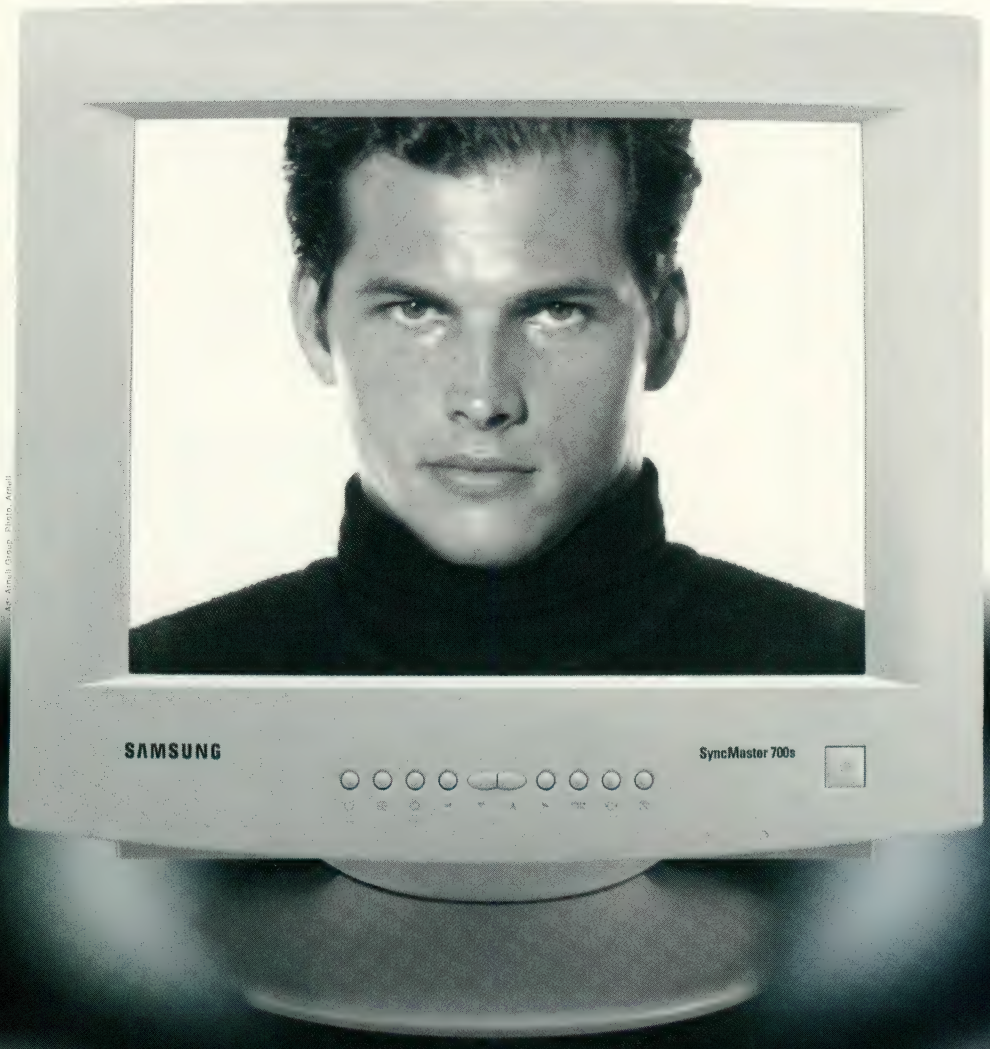
E-commerce packages are catering to even more advanced customers. MindSpring, for example, is offering an e-commerce package for small-business users that helps them get an online storefront running, complete with a payment system and Mercantec shopping-cart technology.

The practice of co-location, where companies house their servers at the ISP's offices, is gaining momentum. Co-location's benefits include higher volumes of bandwidth on demand and the security of putting penetrable systems outside the company firewall. MindSpring goes a step further with a co-location "control panel" that lets you monitor your bandwidth use, look at how many hits you get, and even reboot your machine online.

Other business services like videoconferencing and chat hosting are available, but because of bandwidth restrictions they haven't yet found a major market. The list of value-added services goes on and on—content blocking at the ISP level, automatic spam blocking, secure-transaction hosting, and Web-site development (often the forte of the smaller ISPs these days)—and may now be the determining factor in how you choose an access provider. *—Polly Sprenger*

Illustration by Andrew Shachat

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CIRCLE NUMBER 20

FUTURE OF THE NET

George Gilder has been one of Java's most outspoken advocates. As Java's novelty wears off and flaws emerge, he hasn't lost his enthusiasm.

Java has been criticized in The Wall Street Journal *and other places for failing to deliver the sweeping changes promised. Are expectations running too high?*

It's absolutely inevitable that at this point in time there would be an array of articles expressing reservations about Java. It's the "S" curve: You watch the technology grow with enormous fanfare. You get a million downloads of the Java developer kit. You see 500,000 developers at work. You enlist hundreds of companies and see thousands of applications. And 800 days after the launch of Java, all the protocols, development systems, and interfaces don't all purr. So people begin to notice the flaws and write articles revealing these absolutely predictable developments.

Meanwhile, people are rolling out Java stuff every day. It's moving faster than ever. Despite the controversy, it's essentially been endorsed by Microsoft. Until recently they were telling me it was a figment of Scott McNealy's imagination. And now, Rob Muglia, VP of development at Microsoft, is saying that Java increases the productivity of Microsoft programmers by between three and five times.

Java is becoming the key language. *The Wall Street Journal* article stressed performance, which is completely a nonissue. Within a year or so, a lot of Java programs will run faster than programs written in C and C++ because of the advantages of dynamic compilation and interpretation over batch compilation. Rockwell has just announced a Java processor.

But while the performance issue will be solved because so many companies will want to solve it, that's not the real issue. The key insight of [Java architect] James Gosling is that when you have processors improving in speed at 48 percent a year and memory access times improving 7 percent a year, it's more important to optimize the programmer's time than the processor's time. That's essentially what Java does: accelerate the time to market. That is the most critical problem facing software companies today.

You've said that Java will have sweeping affects on the economy. What did you mean by that?

The key is making component software saleable on the Net. So rather than buying cumbersome suites, installing them on your hard drive, and suffering all of the memory conflicts, bugs, and compatibility problems that afflict so much software, you can download Java Beans over the Net encrypted and decrypt them when you pay for them.

It will be a new way of using software that will be so convenient and efficient that I think it will increase software sales and increase the usability of content including entertainment and multimedia because you'll have executable content sent across the Net.

You often cite Moore's Law, which says processing power doubles every 18 months. Intel thinks it may be picking up the pace.

There may be extensions to Moore's Law, but I think it will continue in effect. However, I believe bandwidth will expand at twice the pace of Moore's Law. While in the past people got rich by exploiting the multiplication of transistors on an 18-month schedule, in the future the spearhead of development will be the expansion of bandwidth.



"It's more important to optimize the programmer's time than the processor's time. That's essentially what Java does: accelerate the time to market."

Many people are discouraged by the slow rate at which bandwidth is growing.

The people who are discouraged don't know what's going on. As recently as two years ago, all the phone systems in the world operated at the rate of one terabit per second. Early last year, NTT, Lucent, and Fujitsu demonstrated one terabit per second down a single fiber-optic thread. This year, NEC demonstrated three terabits per second. One fiber thread can accommodate more information than the global telephone network three years ago. The explosive developments in fiber over the next four or five years are going to overcome most of the backbone problems that afflict the Internet. —*Gus Venditto*

ABOUT GEORGE GILDER

George Gilder has had the ear of technology executives since the publication of his influential book, Microcosm, *in 1989. In writing for* The Economist *and* Forbes ASAP, *he is an outspoken critic of government regulation and closed technology architectures. In addition to Java, he has championed smart radios, Netscape browsers, and all-optical networks. (*http://www.gildertech.com*)*

Photograph by Clemens Kalisher

Announcing A Web Tool Of Donut Proportions.

This is a 360° panoramic JPEG you can "walk around in" on the Web. Discover who surprised Sandy, and you could win PhotoVista or a digital camera free!





Introducing PhotoVista™: 360° Web JPEG's made easy, fast, & cheap.

Who Surprised Sandy?

This is a piece of an actual donut-shaped 360° panorama for the Web. You can scroll around the scene in every direction as a QuickTime® VR movie, or save it as a PhotoVista file that's 1/3 the size and downloads in seconds. Its 12 pictures can be shot with any 35mm, digital, or video camera. And stitched together automatically with a single click. Unlike QTVR, it's editable. And incredibly, created with our new $99 program. Sure, we know you won't believe it until you see it. So we've created a contest to convince you to take a look. When you do, you'll know who's behind the camera surprising Sandy. You'll download a free trial copy of PhotoVista. Maybe even win PhotoVista, or a digital camera, free!

CIRCLE NUMBER 26

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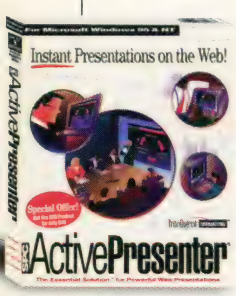
SiteStak is a new family of servers designed for easy Web-site management from Data General's Thiin Line division. The servers ship with pre-installed HTTP-server software and require only 1.75 inches of rack space and two 10/100MB Ethernet connections. Prices start at $4,700 for a 200MHz Pentium Pro with 128MB RAM (888-878-4446 or http://www.thiinline.com).

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PowerSite from Sybase is a tool for developing, deploying, and managing enterprise business applications on the Web. The collaborative development environment helps to build applications incorporating HTML, Dynamic HTML, scripting, JavaBeans, database access, and more, and supports a wide range of Web-application servers. The software presents a unified view of a site and all of its components. Price is not set (http://www.sybase.com).

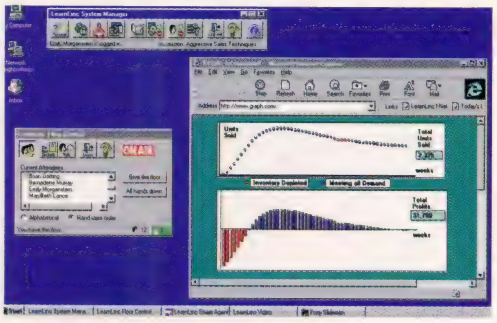
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ActivePresenter from Software Publishing Corp. lets users publish Microsoft PowerPoint or ActivePresenter presentations on the Internet or a corporate intranet. The program's publishing wizard generates HTML and posts the work to your site or ActivePresenter's site (http://www.activepresenter.com). The software runs on Windows 95/NT 4.0 and higher. Price is $49.95 for up to three attendees; $99.95 for unlimited attendees (800-489-6720 or http://www.spco.com).



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LearnLinc I-Net 2.0 from ILINC is for delivering real-time, instructor-led training over the Net or an intranet. The virtual-classroom format allows streaming audio, shared whiteboards, and Q&A sessions. Server license is $50,000 for 100 simultaneous users (518-283-8799 or http://www.ilinc.com).



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Total Virus Defense Suite is security software from McAfee for enterprise networks, providing virus and hacker defense from the client, server, and Internet gateway. Desktop and server products are managed and monitored from one central location. The suite encompasses virus-protection, encryption, firewall products, crash protection, and back-up. Price is $23,000 for a 1,000-user site (408-988-3832 or http://www.mcafee.com).

SurveySolutions 1.0 from Perseus Development Corp. is survey-design and analysis software for the Web. The Windows product creates surveys, posts them on a site or delivers them via e-mail, and collects and analyzes the responses. Typical uses include customer-satisfaction surveys and employee feedback forms. Price is $149 (http://www.perseusdevelopment.com).

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Buz by Iomega enables direct transfer of images and sounds to your PC from digital cameras, DVDs, camcorders, laserdisks, and VCRs. The product combines a video-capture card, Ultra SCSI controller, and editing and publishing software; the multimedia elements can be saved to a hard drive or an Iomega Zip or Jaz external drive. The price is $199.95 (801-778-1000 or http://www.iomega.com).

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Audible Player, jointly developed by Audible Inc. and RealNetworks, is a device for mobile playback of RealAudio content that has been downloaded from the Net (files by audiobook publishers and others will be available for purchase at Audible's site). The player holds about two hours of content and works with headphones or car-stereo systems. The player is $249 (http://www.audible.com).





Emblaze Video and **Emblaze Audio** from Geo Publishing adds streaming video and audio to Web sites and viewers need no plug-ins or downloads. Designers drag audio or video files into the Emblaze program, click to process, and then drop into any Web-publishing program. Both are $295 (800-436-4999 or http://www.emblaze.com).

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SiteMinder 2.0 by Netegrity is security software for deploying intranet and extranet applications. Web developers can control user access to restricted information on a site, down to controlling display of an HTML button, section of text, or URL. Server starts at $3,995 for 200 users; SiteMinder Web Agent is $595 per server (617-890-1700 or http://www.netegrity.com).

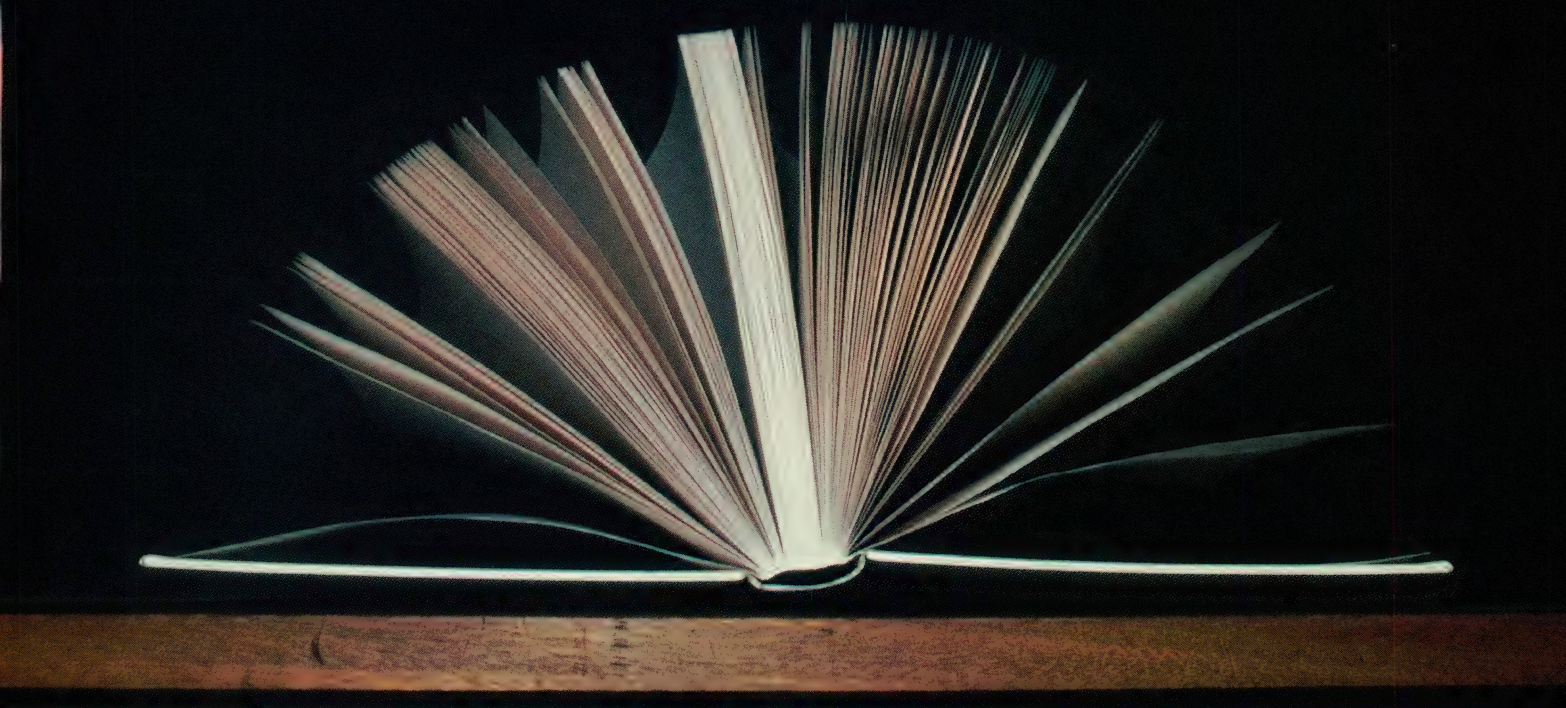
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iNet Solo from Pictorius is a Windows 95/NT Web-publishing tool for incorporating push technology and Dynamic HTML on sites. It also serves up pages based on variables such as domain name, date, and time. No programming knowledge is required. Solo Server is included; price is $249 (800-927-4847 or http://www.pictorius.com).

—Jay Blickstein, Susie Davis, Amy Dunlop, Gus Venditto

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CIRCLE NUMBER 268

Want Speed? Go Digital

Why thrash around when ISDN is simple and reliable? **BY JOEL SNYDER**

Modem companies love the Internet. How could you not love something that requires tens of millions of people to buy your product? But they don't love it enough to give the standards bodies a chance to work before they make a mad rush with new technology. I'm talking, of course, about the massive PR blitz surrounding the new 56K modems (see "Speed Dialing," July *IW*).

Modem companies want to convince you to get rid of your old modem at any cost. For all the hoopla 56K modems have drawn, you'd think that they were the ultimate solution to long downloads. Unfortunately, they're not.

Most modem users with a 28.8-Kbps or 33.6-Kbps modem only get 26.4-Kbps connections. A lucky few get 28.8 Kbps, fewer still get 31.2 Kbps or even 33.6 Kbps.

Data Communications magazine recently published test results showing that connections in the best cases are in the 42 Kbps range, and that "impaired" phone lines will only get 28 Kbps or less. In the July issue, IW Labs published similar, though slightly better, results. Lucky users could see an improvement of 60 percent, while many won't see any improvement.

Sixty percent isn't bad, but, frankly, the payoff I'd get from switching to 56K doesn't seem to justify the expense. [For another opinion, see "The 56K Question" in this issue's ISPEye column.]

HOW TO SELL A 56K MODEM

The situation is simple. Technically, modem manufacturers have figured out how to squeeze a bit more out of your analog phone lines. Previously, the modem gurus would sit down together, take the best elements from each approach, and agree on a good compromise solution.

That's not the way it works anymore. Now, the system works this way: Sell a bunch of modems based on your proprietary approach. Don't worry about beta testing—people are willing to pay for the chance to use new and buggy software. Release a lot of firmware updates along the way to solve this problem. One update every few weeks should keep people coming back to your Web site.

In the meantime, claim superior design and engineering based on a few percentage points difference. Design a logo to put on Web pages. (Animated is better.) Continually point



out how much better the market has accepted your product over your competitors'. Do surveys. Offer rebates.

When the standard is finally hammered out, give almost everyone the ability to change their proprietary modem to a standardized one.

If at all possible, try to manipulate the standard so that your modems can be changed in software and your competitors will require a hardware change.

This is not the first time this has happened. Back in the 9600/14.4K days, Hayes had "HST" modems which were out early, but weren't compatible with the standard when it came out. More recently, the 28.8K modem standard was preceded by three competing versions which were incompatible with the eventual standard.

This year the ISPs are being pulled into the fray. Modem manufacturers are offering free or almost-free upgrades to ISPs to bring their gear up to one of the 56K nonstandards. The competition is fast and furious. After all, they think, for every one they give to an ISP, they can sell 20 to their customers.

The smart ISPs will take the deal if it doesn't cause too many problems for existing users. The dumb ones have fallen and can't get up. One ISP announced on a mailing list that its customers "expected them to have leading-edge technology." These customers must be the same ones who enjoy editing their WIN.INI files (or running RegEdit or ResEdit) on a daily basis. What *I* expect as an ISP customer is uptime, reliability, and performance, as well as some assurance that my ISP won't be tinkering with its modems all the time.

CHUCK THE MODEM, GO DIGITAL

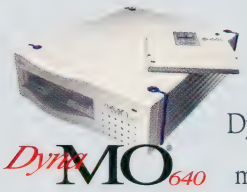
My solution to the 56K fracas is easy: Ignore it. Instead, use ISDN (Integrated Services Digital Network). ISDN replaces the vagaries of analog modems with a fully digital network.

Why get 60 percent improvement with all the headaches of nonstandard modems when you can get 500 percent improvement? That's what ISDN offers. 56K modems are a dead-end, milking the last drops of blood out of analog lines. ISDN is a stepping stone to faster technologies of the future.

Illustration by Eric Yang



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CIRCLE NUMBER 160



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FUJITSU

ISDN gives you everything you're used to with analog phone lines and more. Do you want a phone number for every person in the family, two phone lines, forwarding, call waiting, and caller ID? ISDN does all that.

ISDN is widely available and is used all over Europe. I was in a hotel in Switzerland a few weeks ago and discovered that it had *only* ISDN service in my room.

In Italy, a friend of mine had ISDN in his apartment and we brought up a connection at 128K in eight seconds. It would have taken longer just to dial the number with an analog modem.

The biggest barriers to ISDN are not technical, since ISDN's technology is over a decade old. They're regulatory. Phone companies in the United States have ISDN rates set all over the map. In Arizona, where I live, ISDN is priced right for business users, costing about the same as the equivalent business analog service. In other states, notably California, ISDN prices are similar for residential users as well. As demand for Digital Subscriber Line (DSL) services like ISDN grows, the phone companies will begin to bring rates more in line with normal analog service.

ISDN has another advantage: It's reliable. Analog modems are, next to Microsoft Windows, the ISP's greatest customer support nightmare. A typical support call starts like this: "Why is it that when I call you I connect at this speed, but when I call someone else I connect at that speed?" And then out come the *init* strings, the debugging, the "did you unplug your answering machine," and all sort of other hair-raising and hair-pulling issues.

56K MODEMS ARE A DEAD-END, SQUEEZING THE LAST DROPS OF BLOOD OUT OF ANALOG PHONE LINES.

ISDN isn't like that. Once you get it installed, it just works. And works. Unlike analog services, digital services like ISDN don't change over time. They work all the time, every time, at speeds faster than analog modems can ever hope to hit.

The next step beyond ISDN, the other DSL services (ADSL, VDSL, HDSL, SDSL, and others) go even further. Widespread deployment of other DSL services, though, is going to take many years. There are significant unknowns with existing wiring as well as big questions on how to package high-speed services. Most people are going to have to wait a long time to get Internet service over high-speed DSL.

When you do decide to jump from ancient analog to digital, here are three considerations to keep in mind:

1. Start with the right hardware. The link between ISDN hardware and your TCP/IP stack can be tough to establish. One ISDN adapter is like another, but the software support for linking the adapter to your workstation varies significantly. Motorola's Bitsurfer has become famous for its ease of use in linking PCs to the Internet. I've also had good luck with my Eicon DIVA PC Card (PCMCIA) in my laptop. However, if your ISP recommends a product it is already familiar with, go with that. (See IW Labs, Oct. 1996 and May 1997 at http://www.iw.com.)

2. Be patient. ISDN installation is more difficult because there are more variables than with analog modems. Make an appointment with your ISP to talk you through the changeover. Once you get it set, you won't ever have to change it. But getting ISDN configured will take time.

3. Get your PC updated. ISDN blasts data at your PC much faster than an analog modem. If you use an external adapter, make sure your PC can handle the throughput. If you have a Wintel PC, your UART has to be fast enough to run at 230 Kbps.

You may have to get a new set of drivers or network software. Check the Web site for your operating system and make sure you're up-to-date. Some operating systems, such as Windows 95, have a special ISDN update (http://www.microsoft.com/support) to smooth installation and operation.

Once you're on ISDN your only regret will be that you didn't change sooner. ■

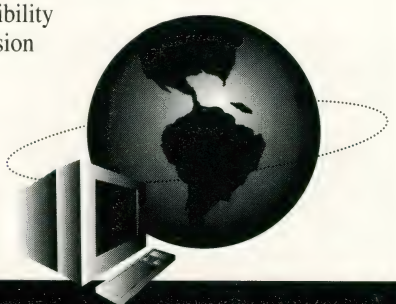
Joel Snyder (jms@opus1.com) is a senior partner at Opus One, an IT services firm in Tucson, Ariz.

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CIRCLE NUMBER 29

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How to sneak your whole company onto the Internet without {technically} breaking the law.

Honestly now, it's impossible to overestimate the importance of Internet access. But with multiple phone lines and separate Internet accounts, all that gets to be a little costly. Enter the WebRamp M3, a single Internet access device that allows everyone in your entire company separate and simultaneous access.



Using WebRamp M3 is a bit like siphoning gas. But without the bitter aftertaste.

Technically, the M3 is a breakthrough router/hub—but since it's designed for utter simplicity, we'll skip the cumbersome terminology. Quite simply, it eliminates the necessity of separate Internet accounts for each user. How? First connect up to three modems to as many ISP accounts. Then connect as many users as you'd like to the M3. In essence, you're "sneaking" your whole company onto the Internet through one connection. (And while that delivers the tasty little rush of getting away with something, we assure you it's quite legal.) With our new M3t "telecommuter model," you can retrieve e-mail, share files, and browse the Internet through your office account from any outside location. Just dial in over a regular phone line and you're connected.

So to really make the Internet work for your business, visit us at www.rampnetworks.com/iworldmag.html or call 888-493-2726 ext. 524 toll-free. We'll send you Charles Rubin's "Internet for Small Business: How to Make the Internet Pay Off," free. At this rate, you may never have to pay for anything again.



WebRamp M3 won the prestigious Best of Show Award at NetWorld+Interop 1997.

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CIRCLE NUMBER 6

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Edited by Jay Blickstein

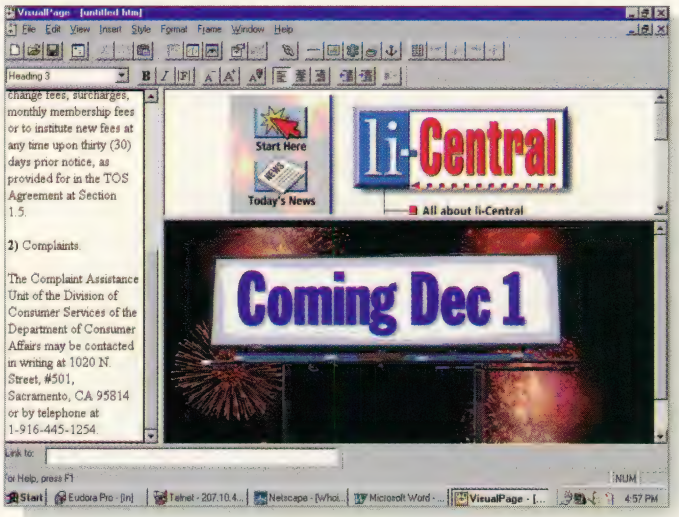
Heavy-Duty Web Tool

Symantec Visual Page BY SEAN FULTON

At a time when many good Web-authoring tools are available on the Internet for free, it's difficult for large software development houses to come up with a product that justifies its cost. But Symantec has managed to do just that with Visual Page, a graphical, easy-to-use authoring program that is easily worth every penny of its $79.95 price tag.

Visual Page combines site-management and document-publishing features with a powerful HTML editor to give advanced as well as novice users an easy path to publishing on the Web. It automates many of the most common HTML authoring tasks, from creating CGI forms to developing frames-based documents and even embedding JavaScript in documents. Symantec says that anyone who is comfortable with a spreadsheet program will have no trouble using Visual Page. But even spreadsheet programs are complicated when compared with this intuitive, easy-to-master tool.

From Visual Page's many pull-down menus, users can add frames and form items or tables, then move them around the document or resize them by simply grabbing the corners of a table or frame. It's as easy as manipulating a table in Microsoft Word, and there is no need for a separate table editor to work with the contents of the table cells.



One of Visual Page's strengths is its frame creation; you can add a frame from a pull-down menu and resize it by grabbing one corner.

Also, unlike many other WYSIWYG authoring programs, users do not have to switch to a special "preview mode" to see how their documents will look. The software's default editing mode is a graphical, point-and-click interface that automatically converts text changes and object resizing into the appropriate code so you can see your changes as you make them.

MORE THAN JUST AUTHORING

Adding QuickTime movies, Netscape plug-ins, graphics, and links to other sites is easy as well because Visual Page lets you simply insert them as objects in your document, without having to understand the coding underneath. The program also provides on-the-fly conversion of BMP and DIB graphics to GIF format, eliminating the need for separate graphics converters.

The software also goes beyond simple document authoring to include powerful publishing tools, such as a built-in site-management tool to help you figure out how your documents are laid out on the site and how they will work together. Publishing documents with Visual Page is a snap, since it supports direct connections to an FTP server for transparent, intuitive site uploads.

The direct FTP connection in Visual Page is particularly valuable for self-starter Web authors. Cryptic FTP commands and unfamiliar third-party programs are the rule when uploading pages to a server, which makes setting up a Web site a daunting experience for the uninitiated. Some Web-authoring programs, such as Microsoft FrontPage 98 and Netscape Navigator Gold, have proprietary extensions that let users upload pages to the company's own Web server, but neither program makes it very easy for users to upload pages to a server running FTP.

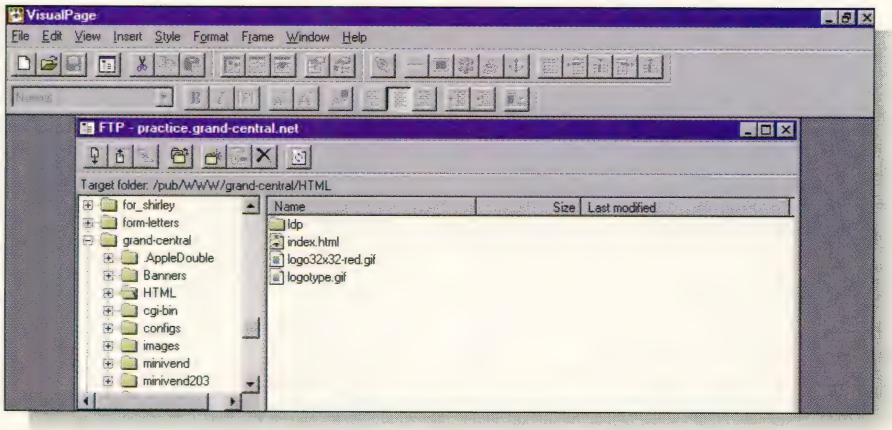
Visual Page, on the other hand, automatically retrieves a directory listing of the remote server and then displays the directory in a clean, easy-to-use format that is similar to the Windows File Finder program. This sort of tight integration with industry-standard programs gives Web authors freedom of choice without sacrificing consistency or quality.

The program also includes a tool that lets users retrieve documents from a Web site within Visual Page, using either HTTP or FTP. This makes updating published information a completely intuitive project that is no more complicated than navigating the contents of a Windows 95 directory.

FAQS & FIGURES

Symantec Visual Page
Price: $79.95
Platform: Mac; Windows 95/NT

Symantec Corp.
http://www.symantec.com
(800) 441-7234; (541) 334-6054



Visual Page's Explorerlike interface makes retrieving and managing Web-site elements an easy task; the software also supports direct links to an FTP server.

While there is no need for the budding Web developer to master any of the arcane complexities of the HTML coding language to create great-looking, complex documents, the software comes with a built-in source browser and source editor that let you add nonstandard tags to your document. The source editor includes a color-coded display of the HTML coding, making it easy to spot mistakes and overlaps.

But one of the most important features of Visual Page is not found in its software. The program comes with a user ID and password for Symantec's Web site, where users can download program updates, extensions, and fixes to help Visual Page keep up with the rapid changes in HTML. This overcomes one of the main stumbling blocks for commercial Web-authoring tools, which often lack the latest Web extensions by the time the software is released to end users.

Symantec Visual Page is a program that any Web author—from small-business do-it-yourselfer to corporate Web designer—will want to have in the tool chest. It's even worth paying for.

Alternate Route to the Net

Bay Networks BayStack Advanced Remote Node

The BayStack Advanced Remote Node (or ARN) access router from Bay Networks is an ideal WAN solution for small businesses or enterprise branch offices connecting over leased-line or frame-relay links to the Internet or a corporate intranet.

The ARN fills a void in the branch-office router market, slotting between fixed-configuration remote routers used by customers of Internet service providers, and the massive, central-site routers used by the ISPs.

With a top price of less than $5,000 (a bare-bones model with 4MB of RAM goes for $1,435), the ARN combines many of the expandability features of a modular central-site router (which costs from $5,000 to $50,000) in a package that is ideal for small, growing networks. The system also offers a flexible alternative to low-end, fixed-configuration routers from makers such as Cisco and 3Com.

Fixed-configuration routers, though reasonably priced (from $2,000 to $5,000), are not expandable. This can be a problem for an ISP customer who wants to add additional leased lines to other offices or providers, or connections to legacy SNA devices such as SDLC and BSC controllers.

Bay has a router in this class, the Access Node (AN), which competes against Cisco's 2500 series, currently the customer router of choice among major ISPs.

Bay's ARN can support up to five simultaneous leased-line connections, or a combination of fractional T-1, ISDN, and 56-Kbps lines. System software choices range from simple IP routing to a full corporate routing kit that supports AppleTalk, IPX, DECnet Phase IV, Banyan VINES, and a host of proprietary protocols.

The ARN scales from a three-serial-port base configuration with 4MB of RAM (equivalent to Cisco's 2501) to five ports with 32MB, enough to handle full BGP4 (Border Gateway Protocol Version 4) routing for a domain.

The system supports frame relay, X.25, and PPP connections, as well as SNMP management and remote configuration, and has an optional RMON (remote monitor) probe for remote traffic monitoring. The ARN's Enterprise Command Center can handle multiple sites with multiple devices, using folders to identify hubs, switches, LANs, subnets, and other peripherals.



The Bay ARN has scalability not found in fixed-configuration routers and costs far less than most central-site units; it's targeted at enterprise branch offices as well as small businesses.

Other options include redundant power supplies and a built-in v.34 modem for out-of-band management and remote administration. The built-in modem eliminates the need for a separate modem to be connected to the console port of the

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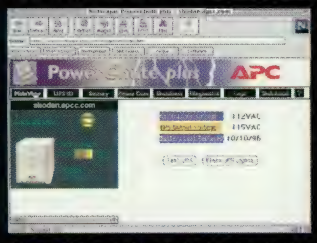
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unit. This makes the system easier to manage from remote or unmanned sites, or at sites where the user community lacks the sophistication to troubleshoot router connections.

The router's system software ships on a 4MB or 8MB PCMCIA flash card, which also holds the system configurations. A simple multiline configuration fits on a 4MB PCMCIA module with no problem.

FAQS & FIGURES

BayStack Advanced Remote Node
Price: $2,145 to $4,963
Platform: n/a

Bay Networks Inc.
http://www.baynetworks.com
(800) 231-4213; (408) 988-2400

In addition, each PCMCIA card comes with the system software and Bay's Site Manager software on a CD-ROM, so administrators can boot the software remotely or store configuration information on a remote server using TFTP.

As for performance, the ARN is quite good, even when loaded with a mix of fractional T-1, ISDN, and 56-Kbps lines. The system backplane supports 2.045MB of throughput, which will work fine for most branch-office configurations. Pushing, say, five T-1s through the router at full bore could lead to some bottlenecks, but that environment really requires a heavier router anyway.

It's also very easy to configure. When the router boots, the administrator can connect through the console port (or management modem) and run a simple script that configures it for IP traffic on the Ethernet port. Once the router is on the network, Bay's graphical Site Manager program can be used to set up the different ports and system-routing configuration.

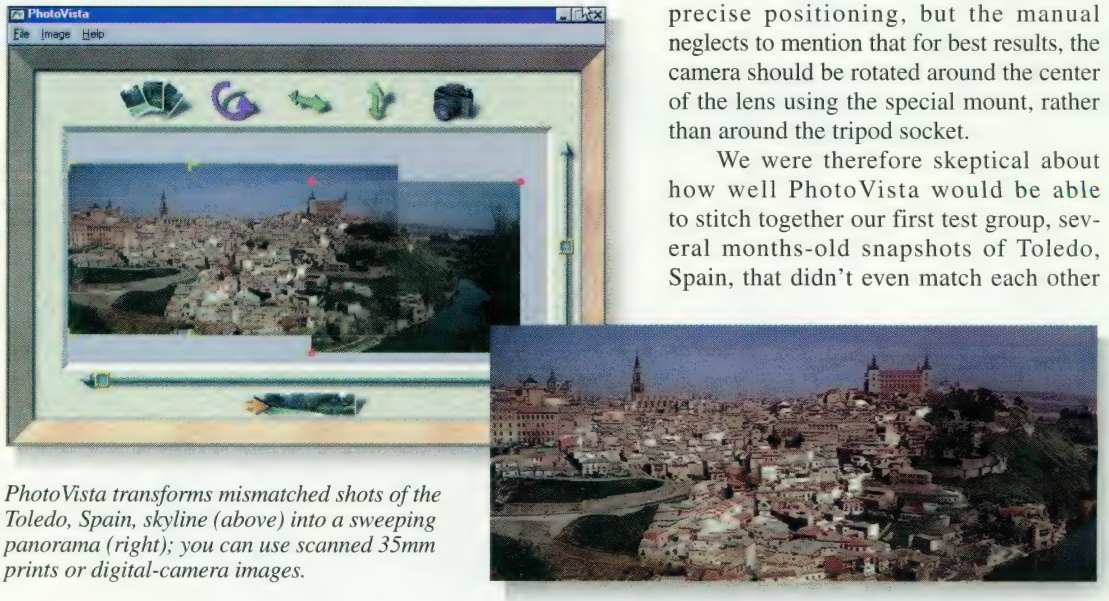
This configuration can then be saved on the router's PCMCIA flash card, or stored on a TFTP server where it can be accessed by the ARN when it boots. The router's configuration can be changed dynamically as well, eliminating the need to reboot each time the configuration is changed.

The Bay ARN is well positioned between the high and low ends of the router market—and it's a fine product in its own right. *—S.F.*

Panoramas on the Web

Live Picture PhotoVista

If you're looking to create a wide-format banner for the top of your Web page, or build 3-D panoramas that visitors can view with the RealSpace Viewer plug-in or a Java applet, Live Picture's PhotoVista generates stunning wide-screen JPEG and VRML images with a minimum of heavy lifting.



PhotoVista transforms mismatched shots of the Toledo, Spain, skyline (above) into a sweeping panorama (right); you can use scanned 35mm prints or digital-camera images.

This bargain-priced ($99) software package for Windows 95/NT and Macintosh takes scanned 35mm-camera photos, or still images from digital cameras, and seamlessly welds them together to form a continuous image. Your panoramic view can encompass a fairly small chunk of skyline or wrap around to offer a 360-degree spectacle. We were amazed at how smoothly PhotoVista assembled professional-looking images from our motley collection of snapshots.

The first step is to compile a series of overlapping pictures using the camera of your choice. (We used 35mm prints in this review.) A Select Lens menu option tells you roughly how many pictures you'll need to take with a particular lens—from eight snaps in landscape mode with a 35mm camera using an ultra-wide 14mm lens to 16 pictures with a normal 50mm lens. There's also a list of digital cameras: You can pick your Kodak DC120 or Olympus D-300L from the list without even needing to know its equivalent focal length.

Next, you'll need to position yourself and swivel around to take the requisite number of pictures. The software's manual points out that a tripod will help you capture evenly spaced photos and suggests a special panorama head with click stops for precise positioning, but the manual neglects to mention that for best results, the camera should be rotated around the center of the lens using the special mount, rather than around the tripod socket.

We were therefore skeptical about how well PhotoVista would be able to stitch together our first test group, several months-old snapshots of Toledo, Spain, that didn't even match each other very well in terms of exposure. We loaded the pictures into PhotoVista, chose Preview Mode, and dragged one of the images to make some slight registration adjustments.

The program then created a merged composite photo that blended seamlessly, even between photos that differed in density. PhotoVista performed even better with other photo sets—both old snaps and


Forward
Stop
Refresh
Home
Search
Favorites
History
Channels
http://www.microsoft.com/ie4/further
File
Edit
View
Go
Favorites
Help
54
FURTH[E]R

those shot for this review according to the software's instructions—creating eye-catching panoramas with little intervention on our part.

You can save the finished image as a JPEG file, screensaver, or a set of matched image/IVR (Image-Based Virtual Reality) files. The straight JPEG images should be used with care, since a Webmaster doesn't necessarily know the width or even the aspect ratio (proportions) of each visitor's browser window. Still, PhotoVista's images made excellent banners.

Visitors to your site who have the RealSpace plug-in can see sweeping views by interpreting the JPEG image using the text information in the VRML 2.0 IVR text file. (Viewing is also possible by downloading Live Picture's Java Viewer from the company's Web site at http://www.livepicture.com; this Java applet cuts download times, but its functionality is not as robust as RealSpace's.) Images stream into the RealSpace Viewer so visitors can begin interacting with the panorama even before it finishes downloading. That shouldn't take too long, either, as the compact PhotoVista files are up to three to four times smaller than those of alternate technologies, such as QuickTime VR. If you want to export files to QuickTime VR format, PhotoVista can do that, too.

FAQS & FIGURES

PhotoVista
Price: $99
Platform: Mac; Windows 95/NT
Live Picture Inc.
http://www.livepicture.com
(408) 438-9610

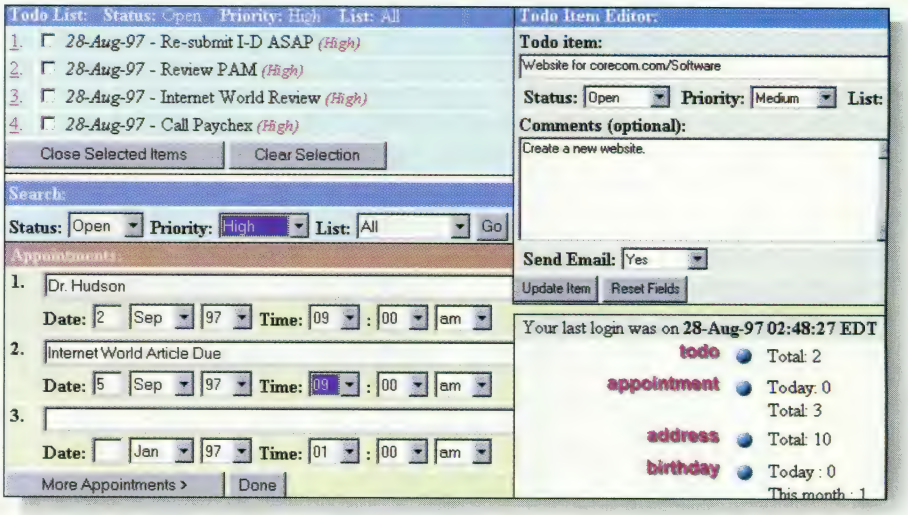
You'll need to place an HTML tag on your page (e.g., <EMBED SRC="Toledo.ivr" WIDTH=400 HEIGHT=200>) to create a window in which RealSpace will rotate your panorama. A MIME type must also be added to the Web server on which your page appears, so the server will know what to do with these images. Experienced VRML coders can edit the IVR file to link other panoramas, create hotspots in the rotating image that visitors can click on to jump to other Web areas, and add other effects.

Anyone looking for exciting content that brings a Web page to life—without hogging precious bandwidth—should investigate Live Picture's easy-to-use PhotoVista software. *—David D. Busch*

Browse Your Schedule Anytime

WebNotions eOrganizer

Does your PIM lack the flexibility you need, particularly when you go on the road? WebNotions' eOrganizer, a browser-based service, provides a raft of scheduling and contact features—including a to-do list, appointment tracker, address book, birthday/anniversary reminder, and notepad—and you can pick up that information anywhere you find Internet access. While eOrganizer lacks features found in most business scheduling programs, such as expense-account tracking and time-management worksheets, its online availability is a major plus—as is the price, free to individual subscribers. WebNotions also insists that all subscriber information is kept secure, accessible only to the user when he or she logs in to the system.



The to-do list and appointment tracker are two of eOrganizer's strongest features; the browser-based service e-mails reminders and password-protects all user information.

You get started by pointing your browser to http://www.eorganizer.com and filling out a brief online registration form (including setting up a password; you also can log in as a guest to try out the service). As part of the registration process, you can configure how frequently you'd like eOrganizer to notify you of scheduled items by e-mailing you reminders. The program can e-mail to-do list updates morning, noon, and/or night; appointment reminders three days prior, one day prior, or on the appointment date; and birthday/anniversary reminders on a similar schedule. These configurations, including the e-mail address to which reminders are sent, can be updated at any time.

When you log in to eOrganizer after registration is complete, the Web page displays a summary of your currently scheduled items. A right-margin menu bar and pull-down list are used for site navigation, and help is readily available on virtually every page. You won't need much help to get started, though—most features are fairly straightforward and easy to use.

eOrganizer offers a set of forms you can use to enter to-do list items, appointments, addresses, birthdays, anniversaries, and brief "scratch pad" notes. These forms are completed online, but currently do not include any import/export capabilities.

The to-do list supports multiple subscriber-created lists that can be viewed by list name, priority (high, medium, or low), or status (open or closed). Detailed comments may be entered to elaborate on each item.

The program's appointment list supports a single listing; each appointment is associated with, and sorted by, both date



Further:: Microsoft® Internet Explorer 4 is a new breed of browser. One where information from your favorite Web sites is automatically downloaded and delivered whenever you want it and where you want it (like right on your desktop). Where channels aren't just channels – they're Active Channel™ Web sites, preset and packed with exclusive content and produced in Dynamic HTML, so you can see all of the rich, interactive content faster. Where Windows® and the Internet speak the same language, so you don't have to shift gears and waste time switching between different applications and the Internet. Where you can run Java™ applications faster. And the world is a happy place where people smile and hold hands and sing songs about rainbows and free software. Get the Web the way you want it. Download Internet Explorer 4 now. It's free.*

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and time. Unlike to-do list reminders, appointment reminders do not occur daily and therefore stop after the appointment date has passed.

The address book feature records information such as name, title, category, phone, fax, cellular phone number, e-mail address, URL, and street address; it also has customizable fields and free-form comments. E-mail addresses and URLs are presented as hyperlinks so you can jump to a Web page or send e-mail directly from within eOrganizer, a helpful touch.

The birthday and anniversary list features are similar to those you'll find on Microsoft Schedule+ and other conventional PIMs. A Notes feature enables free-format text entries, broken down into summary and detail fields and searchable by keyword in either field.

In general, e-mail notification occurs according to the parameters for your account. An exception is made for to-do list items—these can be entered with or without e-mail notification. You can configure your to-do list to arrive each morning in your e-mail client's inbox when you get to work. You can also set up your appointment reminders to be sent the day before and all other reminders sent 10 days prior, so you'll have plenty of time to mail that birthday card to Aunt Edna.

According to WebNotions, upcoming additions to eOrganizer include services geared toward business use (including an online time planner and expense tracker), as well as data export (for example, to synchronize with external schedulers or to print contact lists). The eOrganizer service, though feature-rich for personal use, is fairly basic at the moment, but these additions would make it a robust professional scheduler. *—Lisa A. Phifer*

FAQS & FIGURES

eOrganizer
Price: Free
Platform: n/a
WebNotions Inc.
http://www.eorganizer.com
(973) 316-8965

Tales from the (En)Crypt

PGP for Personal Privacy 5.0

PGP for Personal Privacy 5.0, the newest release of the Pretty Good Privacy software developed by Phil Zimmerman, is a significant improvement over previous versions of PGP. The program converts documents into an encrypted form for transmission over nonsecure networks such as the Internet. Besides offering security against unwanted snooping of its contents, an encrypted document can also verify to the receiver that the purported sender of the document is indeed the actual sender.

PGP 5.0 makes itself easy to use by automatically inserting the basic program functions into the menus of your e-mail program and text processor. Unlike previous versions of PGP, you don't have to stop and launch the entire application.

The underlying functionality that ensures PGP's security is called Public Key Cryptography. A user first generates two keys, called the public key and the private key. PGP 5.0 makes this process rather simple by guiding the user with step-by-step instructions; also, the user interface is a big improvement over the Unixlike command line of the product's previous versions.

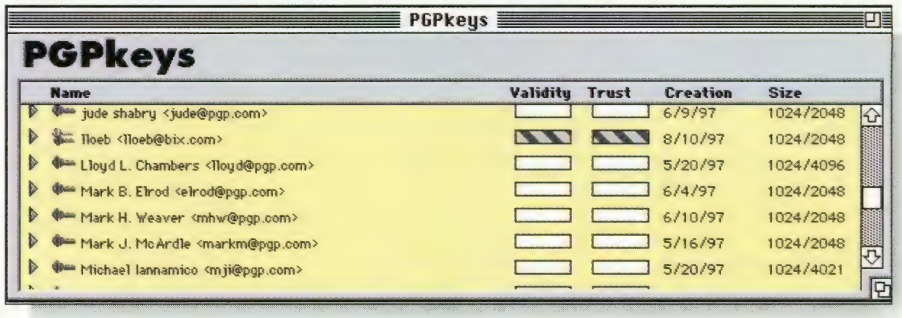
Here's the key process in a nutshell: If I encrypt a message with my private key, you may decrypt the message if you have my public key. This assures you that I did indeed send the message. If you wish to send me a message that only I can decrypt, you encrypt it with my public key. Only my private key (which is kept secret) will decrypt that message. However, if you wish to send me a message that assures me that you are the sender, you must encrypt it with your own private key; I would then decrypt it with your public key.

Managing these keys is an important part of the PGP system. There will always be a certain amount of trepidation about whether you actually have someone's true public key in your digital key ring. PGP 5.0 helps by illustrating which of the keys in your possession have been verified.

The user manual that comes with the CD-ROM version of PGP 5.0 is unusually well thought-out and crisply written. (Older versions of PGP assumed that the user had a basic knowledge of cryptography.) Even a novice can use the system effectively; program wizards guide the user through all the necessary setup steps.

Though PGP has until now had this field to itself, a new competitor, RPK Ltd., has announced an encryption product called InvisiMail (http://www.invisimail.com) that is scheduled to ship by the time you read this.

PGP 5.0 is a major enhancement to an already useful utility and well worth the purchase price. *—Larry Loeb*



PGP 5.0's key cryptography secures Web documents against unwanted snooping. Its tracking interface is a big improvement over those in previous versions of the program.

FAQS & FIGURES

PGP for Personal Privacy 5.0
Price: $69 ($49 from the Web site)
Platform: Mac; Windows 95/NT
Pretty Good Privacy Inc.
http://www.pgp.com
(650) 572-0430

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CIRCLE NUMBER 19

White Pine

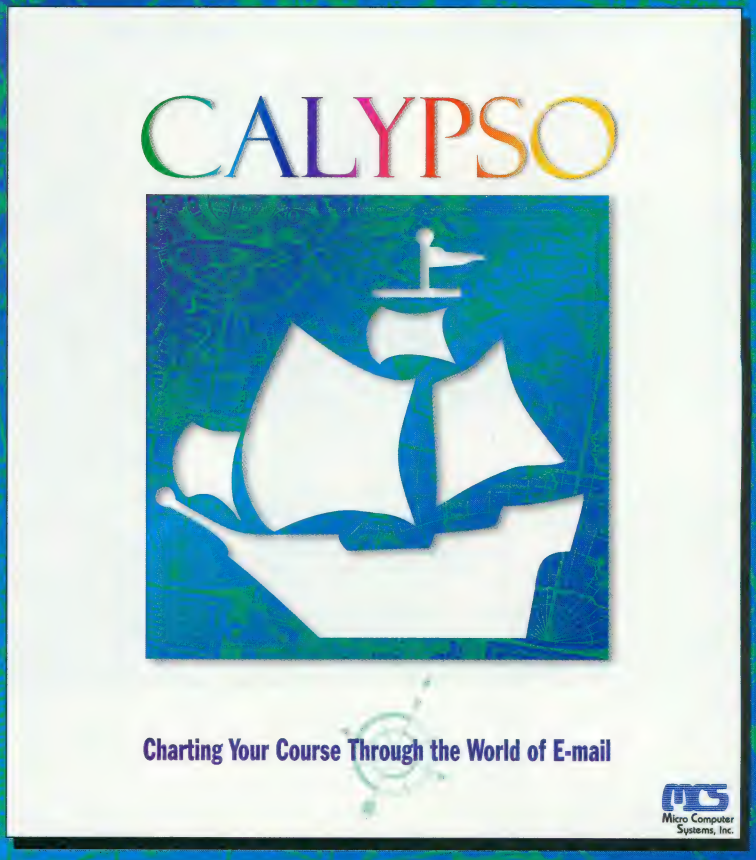
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Persistence Pays Off

For the bible of the manufacturing industry, online success required an about-face.

Online success rarely happens overnight. Fortunately for the Thomas Register, the family-owned company sees patience as a virtue. The New York City-based directory publisher, which will soon celebrate its 100th anniversary, built its first Web presence tentatively, using only its internal technical department to design a utilitarian site.

"In the beginning, we were conservative with our investment," says Pat Daloisio, associate publisher and circulation director of the Thomas Publishing Company.

It wasn't until the company began to invest heavily in online advertising and design that it saw any real returns. Thomas' business is to help purchasing agents find the often esoteric equipment and supplies needed in manufacturing.

The original *Thomas Register* is a 33-volume print directory of 155,000 companies under 57,000 product headings covering everything from anchors (concrete, self-drilling) to zippers (bridge-top, non-separating). The directories are more valuable than the phone book among purchasing agents for manufacturers. If you're not listed in the *Thomas Register of American Manufacturers*, to many of those buyers, you don't exist.

Today, the company also is seeing a good return on its Web-site investment. In 1996, Thomas Register earned $16 million in revenues from the site. Revenues come from selling manufacturers better listings in the register. Though a basic listing is free both in print and online, at the Web site, an enhanced listing can include links to a manufacturer's Web site, a request for information forms, a complete online catalog, or even electronic line-item ordering. A typical enhanced listing costs $3,000 per product. Package deals allow manufacturers to earn a special rate when combining their listings on the Web, print, and CD-ROM versions.

At least one of the company's customers is thrilled with the results. Wanner



Julianne Garry: "It's all about branding." The Thomas Register site attracts over 10 million visits a month.

Photograph by Edward Santalone

Engineering says the online catalog it maintains at the Thomas Register was largely responsible for a $50 million order from General Motors.

To build the site to its current traffic levels, the Register invested in 20 hardware servers, increased its editorial and production staff by 20 percent, allocated $2 million to Internet marketing, and hired a director of Internet marketing. To fill the position, Daloisio says the company went looking for someone who lived the Internet. He found Julianne Garry.

When Garry joined the company in December of 1996, the site attracted only about a million hits a month, driven mostly by ads in the print directories. A redesign was in the works and Garry's first task was to create a promotional strategy.

The new look was unveiled at a Chicago trade show and promoted through newsgroups, press releases, direct e-mail campaigns, and partnerships. The site saw an immediate increase in traffic, rocketing to 5.8 million hits in April 1997.

A link on the Netscape Net Search page added more fuel in May. By July, about 43 percent of the site's 10.5 million monthly hits were coming from Netscape. Garry calculates the cost of the Netscape link at about $5 per thousand visitors, but "the volume is so tremendous it was definitely worth it," she says. "It's all about branding. We are a search source and we need to be recognized with other search services."

In September, the company launched a year-long $250,000 ad campaign, placing the first ads on the Double Click ad network and in November it unveiled another redesign. A key goal for the new look was to continue the branding effort, carrying the look and feel of the company's print editions to the Web. Based on the recommendation of a colleague, Garry hired a Silicon Alley design firm, Nicholson New York, which had worked for IBM and Reader's Digest.

The company is excited about growth now, but admits that early on, it was concerned that the Web site would cannibalize existing print and CD-ROM business.

"We've had fears," Daloisio says. "But we still have users that have been using the print *Thomas Register* for 35 years and they're going to continue using *Thomas Register* in print. The way we look at it, wherever anybody wants to use us, we're there." (http://www.thomasregister.com)

—Donnella Cottrell

Entertainment on Demand

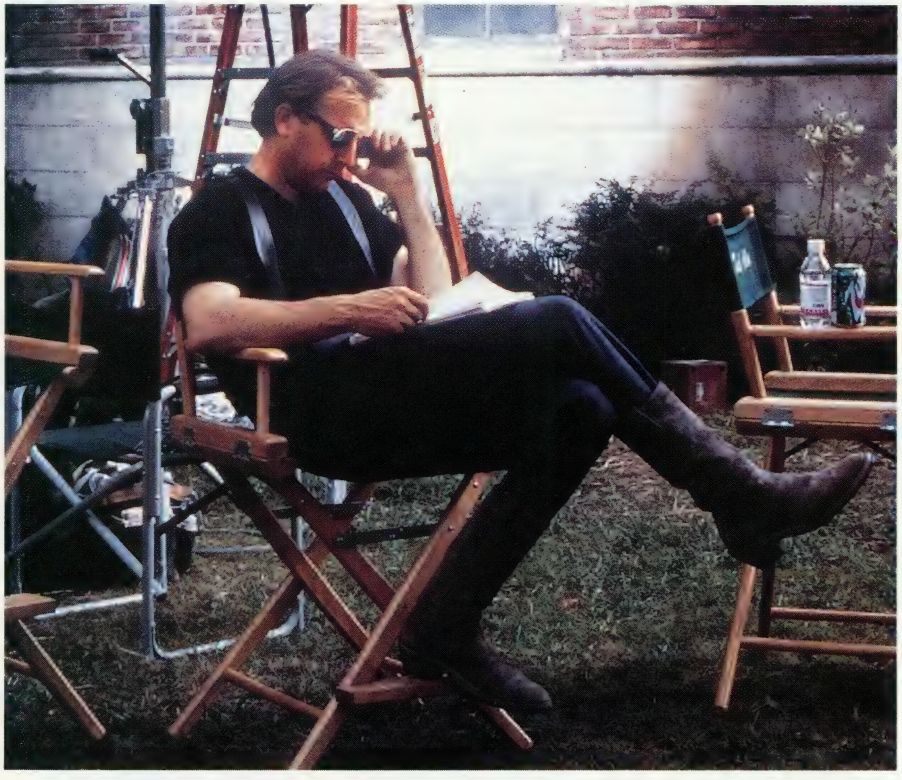
Warner Bros.' Web site may be profitable some day, but for now, it's a way to save on promotional costs.

Time Warner Inc. could never be accused of letting the Internet pass it by. The company's magazine division built Pathfinder into one of the most ambitious megasites on the Web. Its TV news division, CNN, has been so relentless in its effort to lay claim to a leadership role in general news online that it was a finalist for the 1997 Internet World Industry Award for Internet promotion.

But with far less fanfare, the company's entertainment division, Warner Bros., has pioneered its own form of synergy. Less than two years after its November 1995 launch, the Warner Bros. Online site is attracting 30 million visitors a month. It also hosted the largest Internet chat in history, with nearly 20,000 people in attendance when TV talk show host Rosie O'Donnell held court. And it recently broadcast the first live Webcast from a movie set on location.

According to Jim Banister, vice president and general manager of Warner Bros.' online unit, "The site is a vanguard for Warner Bros. emerging media, from interactive television to online commercial services. It hosts any element with an online portion of programming."

The Web site's main role is to promote the films, TV shows, and music offerings from the entertainment division (*The Rosie O'Donnell Show* is distributed by Warner Bros.), but the site's managers believe there is long-term potential in the site as a broadcast medium.



A live Webcast helped promote Kevin Costner's The Postman *on location in Bend, Ore.*

Photograph by Ben Glass/Warner Bros.

Don Buckley, senior vice president of theatrical marketing and new media, found the site to be cost-effective in the way it has helped build interest in Kevin Costner's new film, *The Postman*, scheduled for a Christmas release. In July, the site delivered streaming video direct from the movie set in Bend, Ore. Using VXtreme's plug-in, the live Webcast showed Costner directing a scene from the sci-fi adventure. The expenses were minimal, requiring only a few thousand dollars worth of satellite time.

Buckley considers the exposure a real bargain: "The value to us was far greater than the effort expended." Sixty TV news broadcasts covered the event. "I want eyeballs and the Internet demographic increasingly resembles the profile of a movie goer." He's especially interested in the Web's appeal to the college market, a group that's "difficult to reach."

The long-range plan is for the site to evolve into a full-service distributor of Warner Bros. products. "People are going online for content," Banister says. "We do a lot of market research and focus-group testing and we're applying it online. Content will follow demographics."

The unique blend of media coming together on the Web is also affected by economics. Time Warner is highly leveraged with large amounts of debt while technology companies and access providers have cash. As a result, the Warner Bros. site is eager to share some of its costs via strategic relationships, rather than build all of the content on its own. For example, the site worked with IBM to provide a Net cam displaying on-court coverage of the U.S. Open tennis championship in September.

The strategy is working to a degree. Warner Bros. Online is one of the top entertainment sites in ad sales, according to Jupiter Communications, a New York-based research group. While it doesn't break out online financials separately, insiders say the site is not profitable.

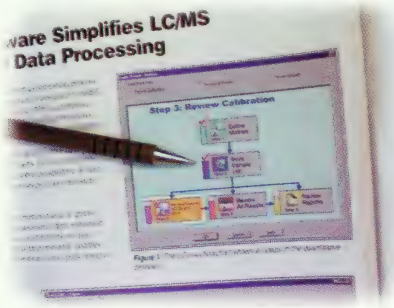
Delivering all of the content requires enormous amounts of storage and massive commuting power. The site recently expanded from its initial battery of Silicon Graphics Challenge servers to include Sun Microsystem Ultra servers running a mix of Unix, Windows NT, and Netscape software. To help manage the hundreds of video and audio clips, the site uses Informix DataBlade, an object-oriented database management system designed for blending files from disparate sources.

While Warner Bros. believes the site will help promote its brands, it also hopes to eventually generate revenue from content online. Right now, the site generates revenue from advertising and sales of merchandise. The store sells everything from $12 *The Wizard of Oz* Ruby Slipper ceramic salt-and-pepper shakers to $28 Bugs Bunny overalls.

"We expect transactions to increase dramatically next year," Banister says, adding that he plans to offer interactive animated characters on demand.

He also plans to push some content to users over a Microsoft Explorer channel in 1998. "We're looking for more clever technologies," Banister says, but he won't let the site become a guinea pig for emerging technologies. "We're staying half a generation behind the technology. We don't want to be ahead of the audience." (http://www.warnerbros.com) *—James Evans*

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CIRCLE NUMBER 38

Building a Better Music Store

For want of a good Miles Davis selection,
Jason Olim set out to change music retailing.

Being the first to execute a concept online doesn't guarantee success. It helps if you're also obsessed with being the best. For Jason Olim, the desire to claim ownership of music retailing online began in February 1994. "I had the idea on a Friday night and by Saturday, I was obsessed."

Today, Olim's company, CDnow, employs 90 people, has 200,000 customers, and receives 1.5 million visitors a month. According to a report from Jupiter Communications, CDnow has grabbed one-third of the exploding music-retailing business online, a market that Jupiter estimates at $23 million in 1997 and $2.8 billion in 2002.

Olim's obsession began when he discovered Miles Davis. "I was totally blown away the first time I heard *Blue,* but when I went looking for more Miles Davis, the only help I could get in a music store was a clerk pointing me to the M section."

He became convinced that the Internet could do what the average music store could not: contain vast libraries of music and give consumers the help they needed in learning about new artists.

As a C and JCL programmer for a developer of corporate e-mail switching software, Olim intimately knew the Internet, but he knew nothing about the music business. So he set out to learn.

His first lesson was that music industry distributors weren't looking for new types of retailers. None of them were interested in working with a retailer who didn't have a store. His idea was dead in the water, until he realized that a college friend's father owned a music distributor.

Barney Cohen of Balley Records was willing to accept the small-order fulfillment that Olim's idea required since his company had already embraced EDI (electronic data interchange). A long-lasting relationship was formed. Balley Records is now growing along with CDnow and recently added several million dollars worth of sorting equipment to keep up with the demand.

Olim continued to work as a programmer as he prepared his business and convinced his brother, Matthew, to drop out of neuro-science graduate program and become his partner. Matthew's first job was to learn programming; he bought a book and, within a week, helped with construction of the first store.



The Olim brothers started CDnow in the basement of their parents' home; they now own a third of a $23 million market.

Meanwhile, Jason took $1,500 he had been saving for an Ibanez guitar and bought a Sun Sparc 1plus. The brothers moved back in with their parents so they could take over the basement in their Ambler, Pa. home.

The store opened in August 1994 as a Telnet site, running over a 14.4-Kbps modem on a permanent Internet connection that cost $300 a month. They placed ads in some of the first issues of *Wired* and spread the word on the alt.music.wanted newsgroup.

In the first month, they had a gross profit of $14 on sales of $387 with a capital investment of $20,000 from savings. "And then came the credit cards," says Olim. To get the $7,000 needed for a commerce server, they signed up for a new credit card.

In October, they opened the Web site and orders flowed in. One of Olim's fondest memories of the time is the day a puzzled Bell Atlantic lineman rang the bell of his parents' home, asking his mother if this was the place that ordered the T-1 line. "They couldn't believe they were laying a T-1 line in a suburban home."

As pundits debated whether consumers would type their credit card numbers at a public Web site, CDnow began taking and filling the orders at an accelerating rate. While customers are given the option of placing an order online or calling by phone to give credit card numbers, very few use the latter option; the overwhelming majority type in their credit card numbers. As secure transaction methods emerged, the site has made them available; it also offers Digicash and ecash.

Today, the site's hardware has grown from that single Sparc station to a bank of Sparc 2000s, two Sparc 3000s, and a 4000. One of the machines runs Oracle to manage the database of over 250,000 unique products. Netscape Commerce Server displays Web pages.

To continue growing, CDnow spends several hundred thousand dollars a month on advertising, mainly to display CDnow ads when keywords are entered at search engines. It has owned keywords like "music" and "blues" on Yahoo and other directories for months. The family-owned business is solidly profitable, but recently accepted a $10 million investment to expand marketing and to develop what Olim calls "discovery-oriented content."

It now publishes music reviews. Some are licensed from *Rolling Stone* and others are written exclusively for the site. Olim's goal is to get customers thinking of the site as a place to learn about new artists. In his view, that's what a record store should do.

"I never wanted to open a record store because I loved programming," Olim explains, "but I wanted a better record store." (http://www.cdnow.com) —*Gus Venditto*

Photograph by Michael Bryant

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CIRCLE NUMBER 9

www.registrars.net

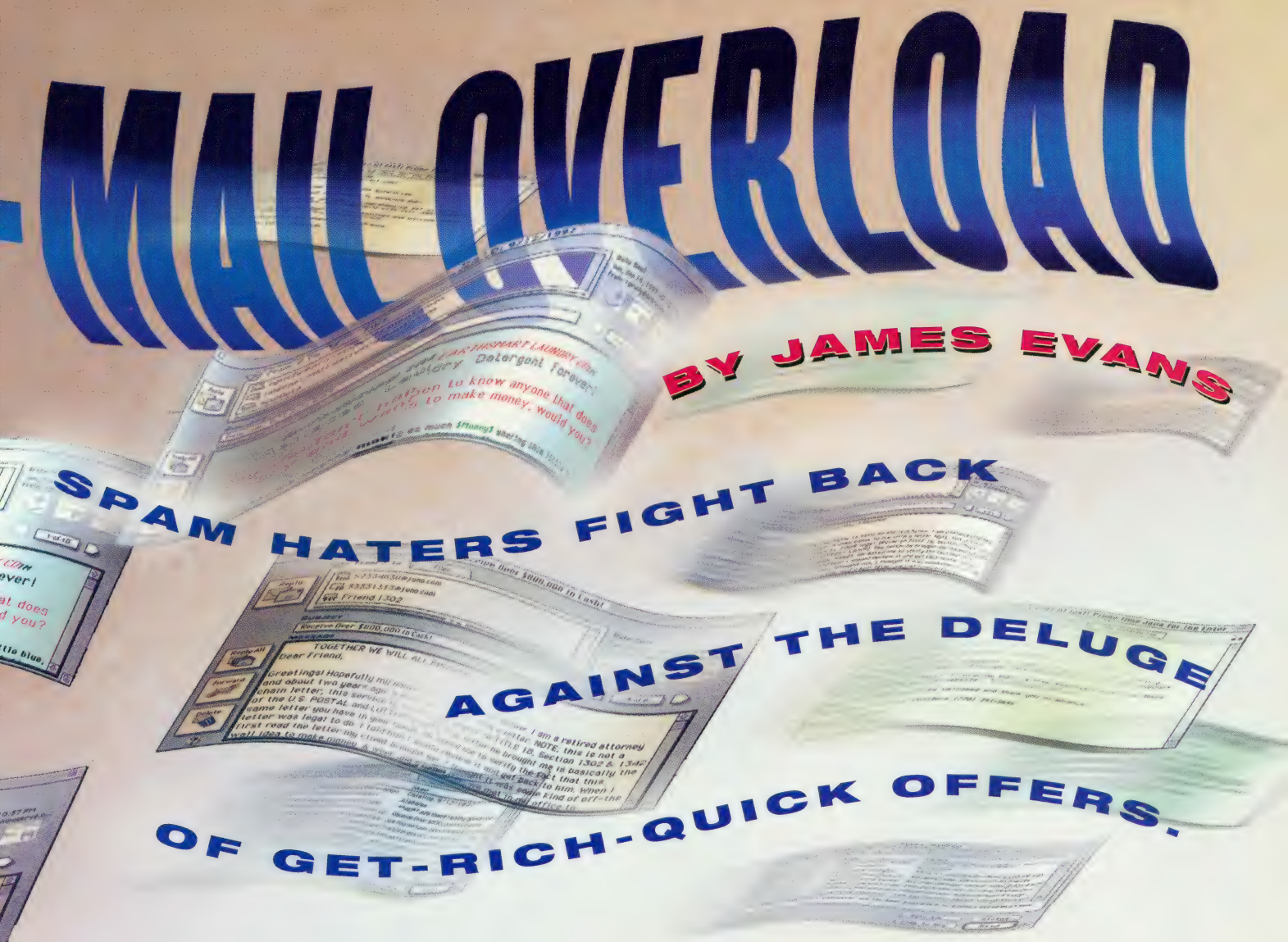


Photograph by Shaffer/Smith

E-MAIL OVERLOAD

BY JAMES EVANS

SPAM HATERS FIGHT BACK AGAINST THE DELUGE OF GET-RICH-QUICK OFFERS.



"I can't see any justification for forcing me to spend my time and money dealing with ads that I didn't ask for and don't want." David Kramer echoes the thoughts of millions of Internet users, but the Palo Alto, Calif., lawyer is not sitting back like others, clicking the Delete key to push the problem out of sight. Kramer is waging an all-out war on direct marketers who send unsolicited e-mail to advertise.

"I have no sympathy with spammers," says Kramer, an associate with Wilson, Sonsini, Goodrich & Rosati. "Junk e-mail shifts the cost from advertisers to recipients and their ISPs. It's the only form of advertising that makes the recipients and deliverers pay. It's unconscionable."

Unsolicited e-mail is being challenged in the courts, in Congress, in state legislatures, and in newsgroups by users who are fed up with the deluge of easy-money promises and scams that jam their mailboxes.

The frustration is at a fever pitch and has taken some radical turns. Last summer, Internet service provider UUNET experienced a "Usenet Death Penalty" for allegedly failing to stop spammers who use its servers. Anti-spam activists deleted newsgroup posts originating from accounts at the ISP, killing the newsgroup messages of individuals as well as direct marketers. UUNET president John Sidgmore said those behind the attack were mistaken: "The group obviously was not aware of the strong antispamming steps we have taken."

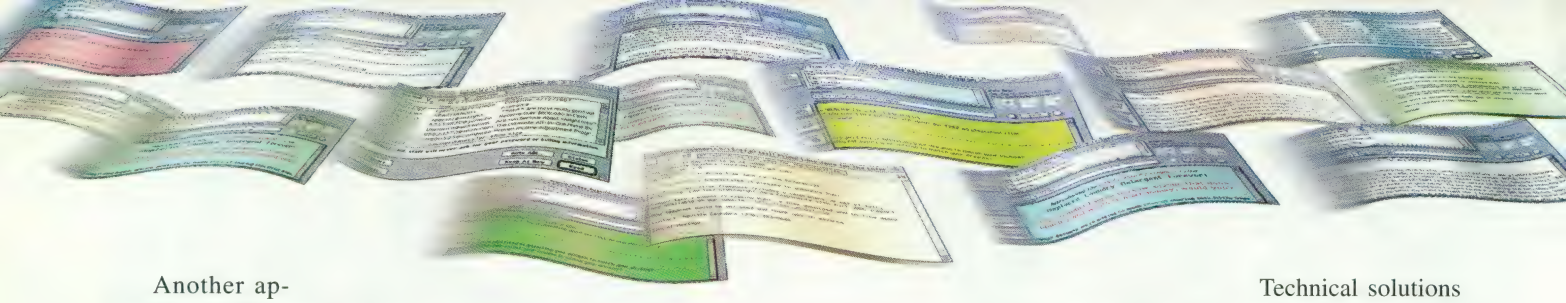
RANGE OF SOLUTIONS

But as ISPs struggle for adequate solutions, the spammed argue that they are stuck with the bill for commercial bulk e-mail. On any given day as much as 50 percent of a typical e-mail account is unsolicited advertising. Time is required to sift through it all and find the sincere messages. Return addresses often are forged, and replies to invitations to "remove" yourself from a list are either ignored or bounced back because the address is fake. And even if you are removed from the list that sent you the offending message, chances are the list was bought from a broker who has already sold your address to 10 new marketers.

ISPs accuse bulk distributors of hogging limited bandwidth, hounding their customers, hijacking their servers by routing hundreds of thousands—and sometimes millions—of identical advertisements through their systems, and generally exploiting the service without paying a cent for it.

Kramer argues a more productive approach would be to legally require direct marketers to use the "opt-in" system: Consumers would receive e-mail only if they accept an offer to be placed on a list.

Alternative solutions include a nonmandatory opt-in program that would pay consumers, and in some cases ISPs, to register to receive sales pitches. At least one company is already in this market: Intellipost.



Another approach, called "opt-out," is simpler: Advertisers offer consumers the opportunity to be taken off lists. But unlike today's situation, they manage the lists carefully, gaining credibility with consumers.

Any solution short of the mandatory opt-in remedy is unacceptable, Kramer says, because they require consumers to take action. He argues the solution is for Congress to pass a sharp-toothed prohibition against sending bulk e-mail without the recipient's permission.

Of four bills already introduced, only one, by Rep. Chris Smith (R-N.J.), has the potential to make advertisers pay attention. Called the Netizen Protection Act of 1997, it would ban all unsolicited e-mail by amending a section of the 1991 Telephone Consumer Protection Act, which banned junk faxes. The other three, the Unsolicited Commercial Electronic Mail Choice Act of 1997 by Sen. Frank Murkowski (R-Alaska), the Electronic Mailbox Protection Act of 1997 by Sen. Robert Torricelli (D-N.J.), and the Data Privacy Act of 1997 by Rep. W. J. Tauzin (R-La.), would merely make it easier for consumers to identify junk e-mail and remove their names from mailing lists—with fines for noncompliance.

Only one state, Nevada, has passed anti-spam legislation, which requires unsolicited commercial e-mail messages to identify the sender and include instructions for removing a name from the advertiser's mailing list. Five other states—Connecticut, Kentucky, Massachusetts, New York, and Rhode Island—are considering similar bills, but state statutes offer little enforcement potential against the international bulk e-mail industry.

Many of the largest ISPs, notably Netcom, are alarmed by the idea of politicians deciding what can be electronically sent or received and lobby against any legislative solution. "We *always* fear legislation," says Glee Cady, public-policy manager for Netcom, explaining that for an industry changing as rapidly as the Internet does, codifying and restricting things now may well impinge advancements later on.

Legislation is unlikely to work, even if passed. Bulk e-mail distributors enjoy free-speech protections that will make it extremely difficult to draft an outright ban that can survive a constitutional challenge.

"Every time Congress has gotten involved with the Internet, it's gone wrong," asserts Paul Hoffman, director of the Internet Mail Consortium in Santa Cruz, Calif. "Trusting the legislature is a really bad idea."

Attempts to legislate the issue will also face formidable lobbyists. Groups like the Direct Marketing Association and Internet E-Mail Marketing Council oppose government intervention.

MOST BULK E-MAIL LISTS ARE GATHERED BY SOFTWARE THAT HARVESTS THE ADDRESSES FROM HEADERS IN POSTS ON LISTSERVERS AND NEWSGROUPS.

Technical solutions are possible and may offer the best chance of relief. Many ISPs will issue a warning or cancel the account of anyone caught distributing bulk e-mail from a personal account.

ISPs seem to have become more aggressive since EarthLink Networks won a court order against one of the largest junk e-mailers. In April, a Los Angeles Superior Court judge issued an injunction forbidding Cyber Promotions from targeting the ISP's subscribers or using its servers to send e-mail. EarthLink's information-security administrator, Harris Schwartz, said the company took action because it was fed up with the barrage of e-mail. He has five technicians working full-time filtering spam and, in an average week, the accounts of 130 spammers are canceled. (EarthLink has 350,000 subscribers.) He reluctantly turned to a legal remedy and has been surprised at how effective the injunction has been. "It hasn't eliminated the spam, but it's cut it back a lot." The case is set for a trial this fall in Los Angeles Superior Court.

Apex Global Internet Services (AGIS), which had provided connectivity to Cyber Promotions, also cut off the company's account for "security reasons." AGIS apparently became the victim of "ping attacks" instigated by antispammers who were targeting the servers where the e-mail originated.

KEEPING SPAM AT BAY

Individuals who want to avoid the avalanche may not be able to escape the deluge completely, but you can reduce the flow by taking a few simple steps to keep your address anonymous.

Keep in mind that e-mail lists are sold by list brokers, so once your address appears on a single list, it can take years to completely "unlist" yourself, even if you ask every marketer to remove your name from their list. If you find you need to abandon your



account's user name, most ISPs, such as EarthLink, will change it for free; Netcom charges a $10 processing fee.

The best way to avoid junk e-mail is to keep the address private. Most bulk e-mail distribution lists are gathered by specialized software that harvests addresses from headers in posts on listservers and newsgroups, so if you don't participate, you will be invisible to all but the most tenacious spammers. (See sidebar, "Going Incognito.")

An effective action you can take is to get a new e-mail address that you use strictly for correspondence and never use it to post messages on a newsgroup discussion, subscribe to a mailing list, or register for an offer at a Web site. Use a different e-mail address for public discussions and for registering at Web sites. This method won't work if you're a member of a service like America Online or if your e-mail address is used by a prominent organization: Distribution lists may target everyone with a specific domain name.

One way to post messages on newsgroups without revealing your address is to use an anonymous remailer like Replay Remailer and Noah's Anonymous E-Mail. These services shield your identity by posting the messages you compose using their own address. More information about using remailers is available from a remailer FAQ written by Andre Bacard, author of *Computer Privacy Handbook* (the URL appears in the sidebar "Click-Through").

If your e-mail address already has been captured but you don't want to change it, the prevailing remedy is to use e-mail software that performs message filtering. The software can be configured to automatically drop most junk in the trash or a folder of your choice. The underlying concept is that certain Internet domain names generate most of the unsolicited mail, so if you block mail from those domains you can ease your headaches.

Nearly all commercial e-mail packages provide easy-to-use filtering options (see the IW Labs review in the November issue). ZDNet has a list of antispam tools in its Software Library which has as many as 3,200 filterable spam domains. Using such software, you can add other offenders with a click of the mouse. There are also long and constantly updated lists of known bulk e-mail distributors available on the Internet, such as one available by FTP from AOL that can be copied and pasted into those filters (see "Click-Through").

Many ISPs employ server-level filters, such as The Spaminator, which is free upon request to customers of MindSpring. E-Scrub Technologies has created filtering software called Deadbolt, designed as a low-cost weapon for the thousands of small ISPs across the country.

Another approach is to refuse to let any mail pass through servers that doesn't originate from or isn't destined to customers of the ISP, which EarthLink Network is doing. UUNET is now attempting to reduce the spam in its newsgroups by filtering out news posts from e-mail addresses that cannot be confirmed.

While filters can intercept a lot of the irritating e-mail, be aware that spammers are constantly changing and registering new domain names, so staying current requires time and effort. Also, the bulk e-mail distributors work hard (and successfully) to defeat filtering techniques.

"Technology solutions won't work because it's so cheap to send spam," says the

GOING INCOGNITO

Disguising your real return address can help you avoid landing on commercial e-mailers' recipient lists. Keep in mind that everyone who receives correspondence from you will see this alias in the header. You can type your real e-mail address within the body of the message where it is unlikely to be caught by address-harvesting software. Replace the symbols @ and "." with the words "at" and "dot" to throw additional rocks in the road. And be sure to notify readers that the return address header has been altered. Otherwise, they may inadvertently record your alias in their address books.

The following tips demonstrate how to change the Return Address option in popular e-mail programs. They'll give you a new identity when you participate in public mailing lists. This strategy is effective only if you run one e-mail application for your personal correspondence and another for your mailing-list activity. To participate in newsgroups, you'll need to change your identity in your newsreader software, too.

In each case, type in a few characters in the boxes for Reply-to Address, Real Name, and pop host. (You need to enter the correct SMTP host in order for the mail to be sent.) Be creative: The bulk e-mail industry is familiar with most of the tricks and has software that automatically removes words like "nospam" and "noads" from otherwise authentic addresses. Avoid using common names since you may be using someone else's identity. A good technique is to mix words and numbers.

Eudora for Macintosh

To change your identity in Eudora, select the Special pull-down menu, then Settings, then Personal Information. You'll see the Return Address field where you can key in your alias.

Eudora for Windows 3.0

The Personalities feature allows you to have multiple return addresses for one account. Delete information under Tools, Options, Personal Info. Then, under Tools, Options, Personality, enter the correct information for the Dominant personality and create a new personality. When you compose a new message, the default will be the Dominant personality; select the other personality when creating public messages.

Netscape Navigator 3.0

Select Options from the menu bar, then Mail & News Preferences from the pull-down menu, then Identity.

Netscape Communicator 4.0

Create a new personality by running the User Profile Manager, which is installed as a separate utility.

Microsoft Internet Mail & News 3.0

Go to Mail, select Options, select the Server tab, click on the Advanced button. You will see the Reply-to field, where you can change your return address.

Outlook Express (Internet Explorer 4.0)

Select Tools/Account. Select the mail tab. Select the account for which you want to change the reply-to address.



Internet Mail Consortium's Paul Hoffman. "It costs less than one cent per message, and marketers are willing to pay one cent to get around all the filters." Hoffman believes the use of filters will ultimately lead to the elimination of small bulk e-mail companies, resulting in a consolidation of the industry into several large enterprises.

DECLARING WAR

For people with the time, inclination, and sufficient desperation to go head-to-head with spammers, particularly the ones who attempt to shield their identity, there are a number of methods for tracking them down. There are several excellent FAQs explaining the various categories of information, called headers, that accompany every e-mail message and how to read them to determine validity. And the newsgroup alt.stop.spamming openly discusses strategies.

The key to spam-hunting is to identify the originating domains so they can be blocked. When addresses are fake, there are ways to find out where the mail originated so you at least can alert the ISP it passed through. A Unix feature called traceroute is available on the Web and built into Windows 95/NT that will identify the route the message traveled from the source. (Go to a DOS window and type tracert, then the domain name you want to trace, as in c:\windows\tracert www.junk.com.)

Once you locate the culprit, you can find out who's in charge by performing a Whois search at http://rs.internic.net/cgi-bin/whois. You'll find the name, address, and telephone number of the technical administrator who may be unaware that his connection is being used for bulk e-mail.

One area that could hold promise is a project of the Internet E-Mail Marketing Council. This group, which represents many of the Net's most ardent direct e-mail marketers, maintains a list of addresses of people who have asked to be removed from all lists (see "Click-Through"). The Council is asking its members to remove these names from their lists. This approach may work over time, but in researching this article and registering with the Council, I found no noticeable change in the amount of spam in my inbox.

Finally, if only for cathartic effect, the Net.Abuse newsgroup and spam-l discussion list offer advice about the latest anti-spam work—and a chance to vent. It may not reduce the flood of junk, but at least it will give your Delete-key finger a rest. ■

James Evans is the author of Law on the Net *and* Government on the Net *(Nolo Press).*

CLICK-THROUGH

Link live at iw.com

Andre Bacard's Anonymous Remailer FAQ
http://www.well.com/user/abacard/remail.html

E-Scrub Technologies' Deadbolt software
http://www.e-scrub.com/products/index.html

Fortune Net
http://www.pe.net/~magical/page1.htm

Internet E-Mail Marketing Council "remove database"
http://www.iemmc.org/remove.htm

Known bulk e-mail distributors
ftp://members.aol.com/macabrus/roguesgallery

Net.Abuse newsgroup
news.admin.netabuse.email

Noah's Anonymous E-Mail
http://noahs-place.com/anon.html

The Replay Remailer
http://www.replay.com/remailer/anon.html

Spam-l discussion list: subscribe by sending the e-mail message sub spam-L yourname to listserv@peach.ease.lsoft.com

Spam Headers FAQ
http://www.stopspam.org/email/headers/headers.html

http://oasis.ot.com/~dmuth/spam-l/#tracking-nslookup

http://www.mall-net.com/spamfaq.html

http://zikzak.zikzak.net/~acb/features/anti-spam-howto.html

http://www.bluemarble.net/~scotty/forgery.html

The Spaminator
http://www.atl.mindspring.com/acct-mgmt/spam.html

Unix traceroute explanation
http://www.boardwatch.com/mag/96/dec/bwm38.htm

http://www.ra.net/tools/trace.html

http://www.exodus.net/noc/utilities/traceroutelist.html

Whois search
http://rs.internic.net/cgi-bin/whois

http://www.inet.net/cgi-bin/whois

ZDNet Software Library, Antispam Tools
http://www.hotfiles.com/roundups/spam/rnp0897.html

Organizations

Coalition Against Unsolicited Commercial Email (CAUCE)
http://www.cauce.org

Consumer.Net's Junk E-Mail Information Site
http://www.cyberpromo.org

Direct Marketing Association
http://www.the-dma.org

Fight Spam on the Internet!
http://spam.abuse.net/spam

No Spam!
http://www.mids.org/nospam

Scam Spam Reporting Page
http://www.junkemail.org/scamspam

www.stopspam.org
http://www.stopspam.org

Resources

Blacklist of Internet Advertisers
http://www-math.uni-paderborn.de/%7Eaxel/BL

Existing and Emerging Laws on Junk E-mail
http://www.tigerden.com/junkmail/laws.html

The Net.Abuse FAQ
http://www.cybernothing.org/faqs/net-abuse-faq.html

Spam court cases from The John Marshall Law School
http://www.jmls.edu/cyber/cases/spam.html

NED



Ned knows he's on a flight to L.A. this afternoon.

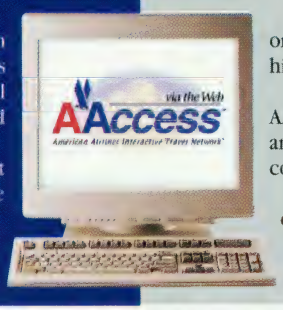
AL



Al also knows he's on a flight to L.A. today. Flight #133, a Boeing 767 departing New York Kennedy at 4 p.m. out of Gate 46, scheduled to arrive into LAX at 7:11 p.m., Gate 45, Baggage Carousel 3. For his seating assignment, he's upgraded himself from 21A to 3A. And is looking forward to watching "Batman & Robin™" on video, which his wife refuses to see, even if it does have George Clooney. Al knows he'll earn 2,475 AAdvantage® travel awards program miles, leaving him just 530 shy of earning his next set of upgrade stickers, which he should pick up later this month. Attaboy, Al.

Pop quiz: Why does Al know so much more than Ned? A) He's a genius B) He's a swami or C) He uses AAccess® – the American Airlines Interactive Travel Network℠, available on the web or with Personal AAccess™ travel planning software.

C – Al uses AAccess. Which means he can get all sorts of flight information. Book and purchase tickets, including Net SAAver Fares℠, and receive an e-mail confirming his booking. He can also arrange upgrades and get up-to-the-minute information on his AAdvantage account, including activity since his last statement. All from his computer.



And right now, Al can earn up to 500 bonus AAdvantage miles for every round trip on American and American Eagle® he books using AAccess and completes by the end of the year.

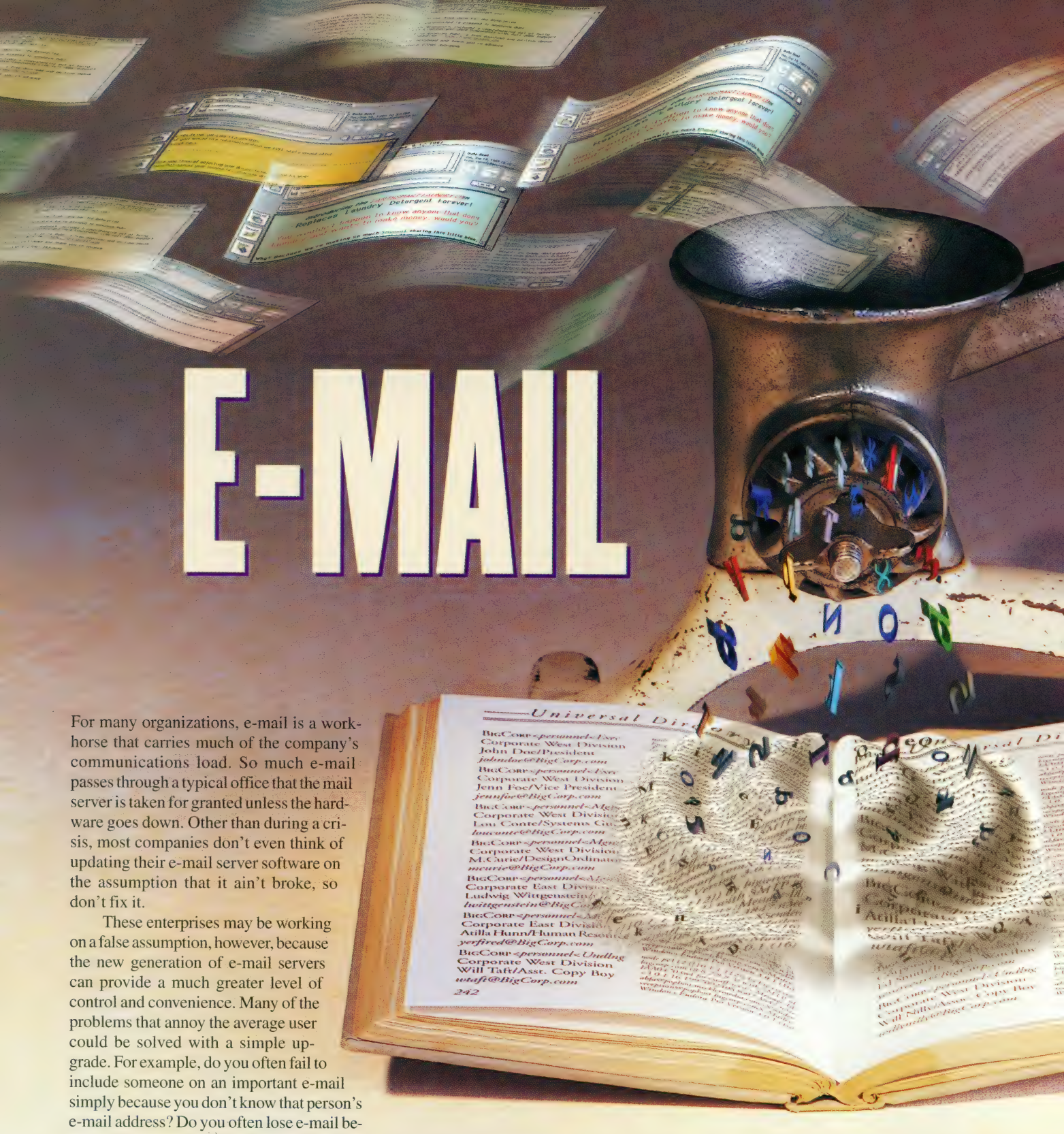
And you can, too. Just visit AAccess via the Web™ on the Internet. Or, for a Windows®-based link to American Airlines, call for our Personal AAccess travel planning software.

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For Internet users, *AAccess via the Web* is located at **www.americanair.com** To order *Personal AAccess* for your PC, call **1-800-AACCESS (222-2377)**.

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E-MAIL



For many organizations, e-mail is a workhorse that carries much of the company's communications load. So much e-mail passes through a typical office that the mail server is taken for granted unless the hardware goes down. Other than during a crisis, most companies don't even think of updating their e-mail server software on the assumption that it ain't broke, so don't fix it.

These enterprises may be working on a false assumption, however, because the new generation of e-mail servers can provide a much greater level of control and convenience. Many of the problems that annoy the average user could be solved with a simple upgrade. For example, do you often fail to include someone on an important e-mail simply because you don't know that person's e-mail address? Do you often lose e-mail because it was downloaded on one machine and you're now using a different one? If so, you could benefit from an upgrade.

In the not-so-distant past, e-mail servers were only available for proprietary network systems from a few big vendors. Then along came the Internet with open standards and e-mail took off. ISPs offered free e-mail accounts with Internet access, increasing the population of e-mail addresses by millions. And corporations have added Internet gateways to their closed systems, so now virtually everyone is connected to the same system.

Today's advancements are not as grand. They won't add millions of new users, but they may help us all become more productive with the time we spend working on e-mail. If you've been content to let your e-mail server go unnoticed, now's a good time to take a closer look at what's available.

A STEW OF STANDARDS

Internet e-mail has an alphabet soup of standards: IMAP, LDAP, M/HTML, MIME, POP3, S/MIME, and SMTP, to name just a few. Of these, IMAP and LDAP arguably

Photograph by Shaffer/Smith



NEW E-MAIL SERVER FEATURES CAN HELP SMOOTH COMMUNICATION.

UNDER CONTROL

BY NELSON KING



have the most far-reaching importance. IMAP (Internet Mail Access Protocol) describes how a mail server handles messages both online and offline. LDAP (Lightweight Directory Access Protocol) isn't just an e-mail standard; it's much broader in application, but it provides a solution to the problem of finding e-mail addresses.

For some time now, we've been using Internet servers and mail clients that use POP3 (Post Office Protocol 3). With this type of server, you download all your mail and then work offline. Typically, your messages are deleted from the server after they've been downloaded. This offline approach works well as long as you use one computer. However, if you have an office computer and a portable machine, only one of them is updated by connecting to the server and you have a synchronization problem.

IMAP, now in its fourth version (IMAP4), can also do offline processing, but its strength is online operation. In online mode, the client can ask the server for headers or the bodies of specified messages, or to search for messages meeting certain criteria. Messages stored at the mail server can be marked "deleted" or "answered," and they stay in the server until explicitly removed by the user. That means, for example, you can read messages from your laptop and then later upload them to your desktop computer. In short, IMAP4 is designed to permit manipulation of remote mailboxes as if they were local; both incoming and archived messages can be stored on a server and accessed in the same way from different computers. You can do this even if the computers don't use the same operating system or connect with the same LAN software.

There are a number of other advantages to an IMAP4 server, such as the ability to share mailboxes, which makes it possible to organize group or corporate mail for security and administrative purposes. IMAP4 can also let you selectively upload portions of a message. Say you're in a hotel room and want to check your e-mail. One message has 3K in text and an attached 10MB graphics file. If you have a POP3 server, you're in an all-or-nothing situation because it can't separate the message from the attached file. However, with IMAP4 and multipart MIME messages, you can transfer only the parts of a message you select.

Early versions of IMAP won only lukewarm support, but in the past year e-mail vendors have been in a mad rush to comply with IMAP4. The new protocol offers enough advantages so that all the major vendors have, or will soon add, the capabilities to their products. Qualcomm's Eudora Mail Server offers IMAP4 as the native protocol; for others (see table), such as Microsoft's Exchange or Novell's GroupWise mail server, IMAP has been adapted to interoperate with LAN-based mail services.

MIME (Multipurpose Internet Mail Extensions) is another of the major protocols that mail servers are beginning to exploit. The main function of MIME is to facilitate attachment and reading of binary files (e.g.,

LEADING E-MAIL SERVERS AT A GLANCE

Company	Lotus/IBM	Microsoft	Netscape	Novell	Qualcomm
Phone/URL	(800) 343-5414 http://www.lotus.com	(800) 426-9400 http://www.microsoft.com	(415) 937-2555 http://www.netscape.com	(800) 638-9273 http://www.novell.com	(800) 238-3672 http://www.eudora.com
Mail server	cc:Mail 8.0 server, Domino Mail server	Microsoft Exchange 5.0	Messaging Server 3.0	GroupWise 5.2	Eudora WorldMail Server 1.0.1
SUPPORTS:					
IMAP 3.0	Yes	No	Yes	Yes	Yes
IMAP 4.0	Yes (connector)	No	Yes	Yes	Yes
POP3	Yes (connector)	Yes	Yes	Yes	Yes
SMTP	Yes	Yes	Yes	Yes	Yes
LDAP	Yes	Yes	Yes	Yes	Yes
MIME	Yes	Yes	Yes	Yes	Yes
S/MIME	No	No	Yes	No	No
Directory server	Domino Directory	Active Dir. Services	Netscape Dir. Services.	Netware Dir. Services	WorldMail Directory
LDAP product or component	Full support in next version	ADS Interface (ADSI), LDAP.DLL	DS 3.0 in beta	LDAP for NDS (LDAP.NLM)	LDAP directory server
Platforms	Windows 95/NT, Unix, OS/2	Windows 95/ NT 5.0	NT, Unix	Windows 3.x/ 95/NT, Unix	NT 4.0
LDAP clients	CC:Mail 8.0	Outlook Express (e-mail), Exchange Server 5.0	Messenger (e-mail)	GroupWise 5.2	LDAP clients or browsers

pictures and documents). Two variations of MIME have come to the forefront in the last year or two: S/MIME (see sidebar), a security encryption for messages, and M/HTML (MIME HTML), a new protocol for transmitting HTML pages as mail messages. For the most part, MIME features are integral to mail clients rather than servers, but as in the case of IMAP4 with MIME messages, servers are beginning to take advantage of the various MIME protocols.

DIRECTION FOR DIRECTORIES

Equally important to the MIME protocols for both mail servers and clients is the ability to find information about e-mail addresses. This is the realm of the directory service. If you need to find a telephone number, you can check the White or Yellow Pages or dial directory assistance. If you need to find an Internet e-mail address or a company's URL, it's not so convenient—and sometimes not even possible. Some of the most important directories are on corporate networks and thus unavailable to anyone outside the company. There's a solution, however: LDAP, an Internet standard that holds the promise of tying together many different kinds of directories.

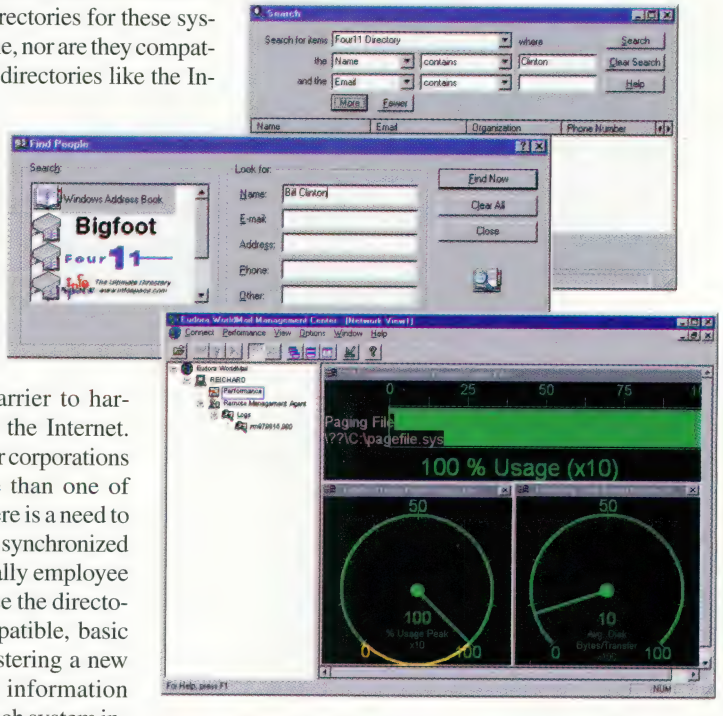
The basic problem stems from a lack of standardization. Just as there are many proprietary mail systems, there are competing directories associated with various network systems. Novell, Microsoft, Banyan, Sun, and IBM use different methods for storing directory information about network users and how to locate them. The directories for these systems are not compatible, nor are they compatible with commercial directories like the Internet Yellow Pages. Consequently, if you need to send an e-mail to, say, a prospective customer, you often can't locate that person's e-mail address because it's buried in a corporate network—an obvious barrier to harnessing the power of the Internet.

It's also typical for corporations to operate with more than one of these networks and there is a need to keep some information synchronized between them, especially employee data. However, because the directory systems are incompatible, basic maintenance like registering a new employee means the information must be entered into each system individually. This takes time, is prone to error, and is not cost-effective.

Thus the question is, in the absence of a monopoly like the one that created standardized telephone directories, will we ever see an equivalent directory for computer networks and the Internet? Probably not; at least there won't be a universal directory anytime soon. However, before long, we should see a standard method of accessing directories through LDAP.

LDAP'S NO LIGHTWEIGHT

Don't jump to conclusions about the word "lightweight" in LDAP; in this case, it's more related to being on a diet than a lack of power. LDAP was devised to overcome problems with X.500 technology, the directory standard endorsed by the International Standards Organization and International Telecommunications Union (ISO/ITU). X.500 covers all the protocols and specifications necessary to create and access a universal directory, but it's big, complex,



Eudora WorldMail Server can connect to LDAP directories so users will be able to search for e-mail addresses with their client e-mail software.

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CIRCLE NUMBER 23

and not a good fit for millions of personal computers on the Internet.

LDAP was designed to use the Internet's TCP/IP protocols. It requires fewer resources than X.500 and has simpler functions, making it easier (and, presumably, less expensive) for vendors to implement. And it reduces bandwidth use by encoding its protocol elements in ordinary text. If you think of a network directory as a specialized database, LDAP specifies how to request information from a directory. LDAP does equally well helping directories locate servers, server peripherals (printers, modems), and even applications or documents, which mail servers can use to expand their features beyond personal mail messages.

Besides being a standard of the IETF (Internet Engineering Task Force), LDAP has been endorsed by most of the key Internet players—Netscape, Microsoft, Lotus, IBM, Novell, and Sun—and most of them have, or will soon have, LDAP implementations. Typically, these companies haven't all gone about adoption in the same way. For example, Netscape, true to its all-Internet interpretation of computing, has chosen to make LDAP the center of its directory services, including its directory server. Novell has added an LDAP NLM (NetWare Loadable Module) to run on its network servers, but has been relatively careful to make LDAP subsidiary to its industry-leading NDS (NetWare Directory Services). Microsoft, ever so slightly the odd man out, has announced it will incorporate LDAP in the upcoming version of Windows NT 5.0, but will make it just one feature of its Active Directory Services (ADS).

If you think some of this sounds like certain vendors are hedging their bets on LDAP, you're right. The commitment to LDAP is genuine, but some companies argue that their own directory system is more complete. Novell, for example, points out that scalability, replication, and programming interfaces are better provided by its own NDS software. Many vendors, especially those with X.500 products, want LDAP to remain purely an access protocol. However, that's not where LDAP appears to be going. Behind much pushing from Netscape, LDAP version 3 should be ratified by the IETF by the time you read this. It expands and enhances LDAP to cover some of its most commonly cited shortcomings, such as lack of security, the ability to handle failed directory requests, and the ability to work directly with a directory's structure.

These new features directly challenge (or even duplicate) features of X.500. The argument that extending LDAP is equivalent to re-inventing the wheel has some validity. On the other hand, there is also truth in the notion that LDAP will continue to evolve because it is ideal for the Internet, and it's the Internet that's driving the world of computing. This is the long way of saying "go with the flow."

Led by Microsoft's new Outlook Express and Netscape's Messenger, the ability to find e-mail addresses by searching LDAP directories such as Four11 and Bigfoot is becoming common. Mail servers will soon begin to incorporate access to directories through LDAP, although this will be less apparent to the user. Eudora WorldMail, for instance, has incorporated an LDAP-compliant directory for its own repository of e-mail addresses. Other mail servers will use information from external LDAP directories for administrative tasks like replicating message databases and accessing network resources.

It's tempting to talk about the future of Internet e-mail as a universal communications medium in which anyone with a computer can send a message to anyone else in the world. The fact is, however, that given the features present in IMAP4, MIME, LDAP, and the other Internet mail standards, there's already plenty of reason to upgrade your mail server, and especially to move from proprietary mail systems to those based on Internet protocols. There's no reason to wait for a crash to make your mail server an up-to-date, powerful business tool. ■

Nelson King is a contributing editor to Internet World.

S/MIME: THE DEBATE GOES ON

The current controversy over S/MIME (Secure MIME), an encryption protocol for e-mail, is a switch on vendors' protectionist attitudes toward other e-mail server standards vis-a-vis their own products. Here, the Internet Engineering Task Force (IETF) is refusing to ratify the S/MIME standard because it uses technology proprietary to a company.

S/MIME is an extension to the MIME (Multipurpose Internet Mail Extension) protocol, which encodes files attached to e-mail messages. S/MIME provides encryption of the message itself, making it difficult or impossible to read the message without the proper decryption mechanism.

The key to the proposed S/MIME encryption—a security feature called a public key—is based on an encryption scheme from RSA Data Security Corp. The IETF has an ongoing aversion to proprietary technology, no matter how widespread or technically effective. This past summer, in a dramatic move, it rejected S/MIME because of the RSA encryption. Stung by this rebuke, RSA has since promised to work with the IETF. A new proposal for S/MIME version 3, which allows for the exchange of encryption keys other than those from RSA, was submitted as we went to press. "This is a more palatable spec; whether it's better depends on its implementation," says Tim Matthews, product manager at RSA.

Because almost all vendors of e-mail software already use MIME, S/MIME has been readily accepted even before its ratification as an Internet standard. More than one million S/MIME certificates have been issued to date, says Jim Bidzos of RSA, and both Microsoft (Outlook Express) and Netscape (Messenger) have included S/MIME with their newest e-mail programs. Acceptance of S/MIME by the IETF would solidify the protocol's standing by making it an actual, as well as a de facto, standard.

STOPPING VIRUSES AT THE GATE

In many organizations, e-mail viruses are more vexing than the common cold. Thousands of viruses travel around the Internet on any given day, and while viruses cannot hide inside a text message, many are passed through e-mail servers as file attachments.

Viruses can spread quickly through an organization when one person sends a file attachment and others pass it on. If every desktop computer is running an up-to-date virus-checker, the problem is caught when infected e-mail is downloaded onto the computer's hard disk. But if no protection or an outdated virus-checker is on the desktop, the virus may infect other files on the disk and then move to other unprotected systems. Microsoft Word macro viruses, for instance, are often passed by e-mail.

The best solution is to filter messages right after they pass through the mail server and before they reach clients. The three leaders in this field are Trend Micro's InterScan VirusWall (http://www.antivirus.com), McAfee's WebShield (http://www.mcafee.com), and Symantec's Norton AntiVirus for Internet E-Mail Gateways (http://www.norton.com).

Not only do these products scan all e-mail attachments (both incoming and outgoing), but they can also catch viruses in FTP and HTTP transfers. Prices are based on the number of users and usually include an annual license for virus-pattern updates. —*Gus Venditto*

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CIRCLE NUMBER 27

Netscape Communicator or Microsoft Internet Explorer

They're not just browsers any more; choosing one has strategic ramifications throughout the enterprise.

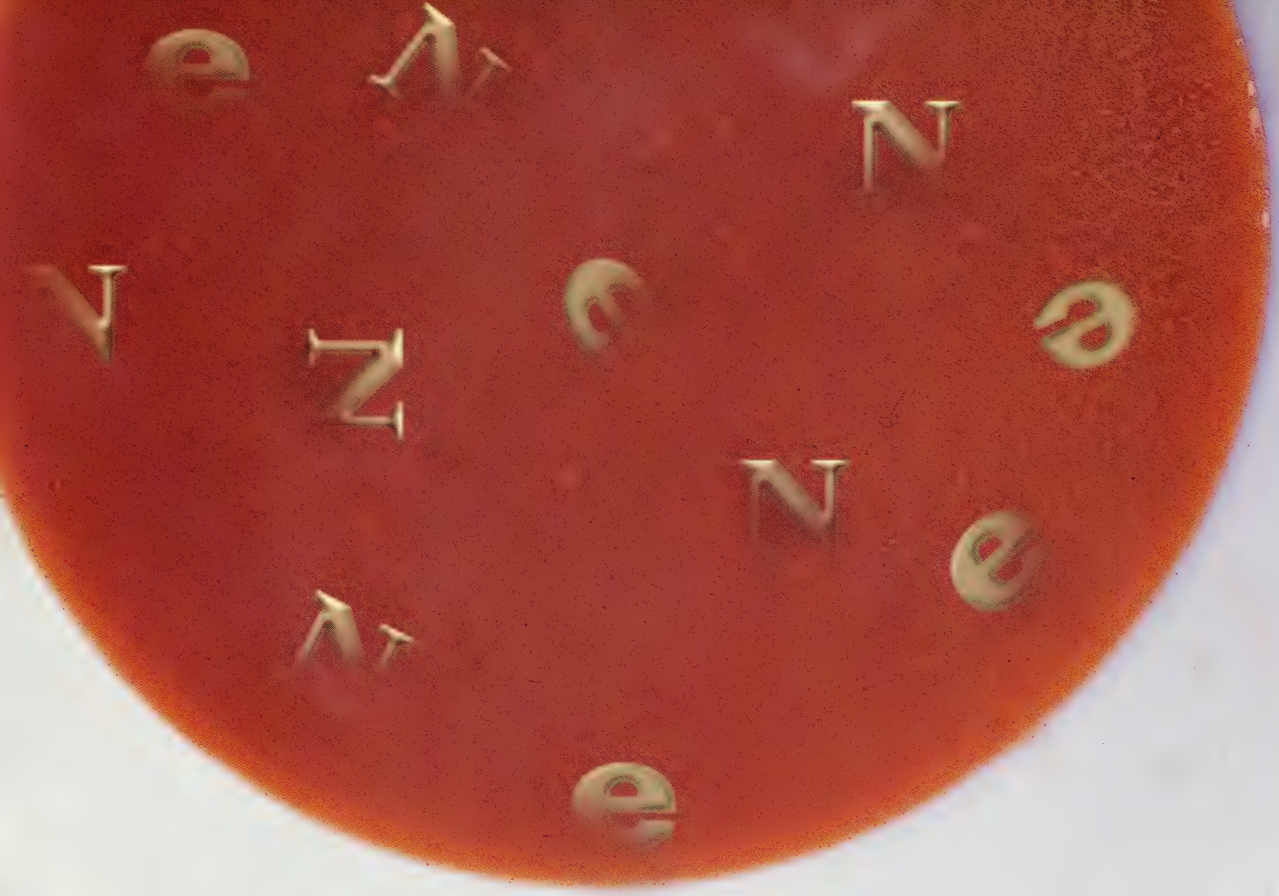
BY DAVID HASKIN

Suite

LIKE A COUPLE OF AGGRESSIVE heavyweights in a title fight, Netscape and Microsoft continue to slug it out for World Wide Web domination. The main tactical weapon of both combatants is their browser-based client packages, which they claim will make your enterprise more productive and more profitable.

A couple of years back, these product offerings consisted only of browsers and e-mail front ends that at best could be described as perfunctory. The current 4.0 versions of Microsoft Internet Explorer and Netscape Navigator, however, have evolved into rich suites of network client products. The goal of each vendor, of course, is to get you hooked on these suites so, in turn, you'll buy their other Internet products, such as their Web servers.

Given the fast-and-furious marketing campaigns these software competitors are mounting, plus the ever-growing long-term implications of choosing one brand over the other, picking the product that best fits your enterprise is becoming a complex chore. Rather than re-hash the browser wars, let's look at the more



Decisions

important question: How does the choice of either environment affect your overall use of the Internet and workgroup-based applications?

At first glance, the competition between the two browsers seems simple. Internet Explorer has a tremendous price advantage because it's free. Although Netscape recently unbundled Netscape Navigator from the rest of the Communicator suite, it still retails for $39 per single copy (with modest volume discounts available). Communicator, however, has the edge in the number of platforms it supports: 17 in all, including multiple varieties and versions of Unix. Microsoft continually releases the Windows versions far ahead of the Mac and Unix varieties (see Suite Feature Comparison Chart for details). However, Microsoft recently said it would step up the pace of its Mac development.

BROWSERS

Neither browser has a clear advantage regarding features or the ability to display Web pages. Both are mature products, and aside from a few small differences in how they support dynamic HTML and ActiveX components, they display Web pages with an equal amount of polish. The browser decision is pretty much an issue of personal preference. Some people are simply more comfortable with one product because they've invested the time to customize the options or prefer a small convenience feature. For instance, I am partial to the way Internet

Photograph by Sandy Burstein

Explorer 4.0 handles Web searches. (You conduct the search and view result lists in one frame while viewing found pages in the other; Netscape makes you switch back and forth between search page and Web site.) Overall, IW Labs testing and interviews with dozens of experts could identify no clear, substantive differences in basic browser functionality that is likely to have enterprise-wide implications aside from Microsoft's embrace of ActiveX.

Winner's Circle: Looking only at browser functionality, it's a dead heat. Personal preference may come into play, but both browsers are powerful and refined.

INTEGRATION & CHANNELS

Efforts to integrate the Web and the Windows 95 desktop have received tremendous attention in recent months. So has push (channel) technology, which brings information to the desktop, saving the user the trouble of going out and getting it.

Internet Explorer has traveled somewhat farther down this dual path than Navigator. Its Active Desktop is a conglomeration of refinements ranging from dynamically replacing wallpaper with up-to-date, pushed Web pages to integrating Internet Explorer with Windows Explorer. This latter integration is a precursor to what we'll see in the Windows 98 operating system scheduled for release early in 1998 (see "Windows 98 Embraces the Web," Nov. *IW*).

But are integration and push technology useful to the enterprise? The collective opinion of our IT-professional and industry-analyst contacts is: Not yet.

"Today's implementation is trivial: All it's done is take the clutter on the desktop and made it worse," says Stan Dahlberg, an analyst with Forrester Research. "But in the future, the Active Desktop idea redefines how people productively use their computers. When it's implemented fully, the data becomes live and the software becomes live. But we're looking at the beginning of a three-year journey."

Integrating the Web and operating system, combined with push technology, will allow for automatic software updates and automatic updates of mission-critical data culled from active applications such as databases. For example, a sales staff can have up-to-the-minute price and availability information available for customers.

For now, both products are suitable for transmitting organizational information to desktops; most IT managers we contacted were looking at this capability for near-term deployment. Mostly, this involves corporate news of the type commonly generated by the human resources department.

At this stage, Dahlberg and others are unanimous: Internet Explorer has the early lead. That's because of its embrace of the Channel Definition Format (CDF) standard, an XML-based metadata file downloaded to the client that describes the HTML resource being pushed to the desktop. Netscape has been, as Dahlberg put it, "retro" by trying to transmit the same data using HTML, Java, and JavaScript.

Winner's Circle: Microsoft by a nose. Channel technology is currently more interesting than useful and, for now, either product will push information to the desktop. At the moment, Internet Explorer, with its support for CDF, appears more flexible. Desktop/Web integration is similarly premature, but Microsoft's got a lead here, too.

Are desktop integration and push technology useful to the enterprise?

Not yet.

INTEROP & ADMIN

Nowadays, I expect a browser to work with any application we're pointing at," says an IT manager at a large public relations firm. "It wasn't always that way, but now they're both pretty good in that regard."

The manager was referring to how a browser from one vendor works with servers and HTML resources developed by products from the other company. Nobody we talked to had experienced problems in this regard with the version 4.0 products—at least not yet—although all were anxious about it and were testing vigorously.

There are, of course, quasi-religious differences between the vendors. Microsoft pushes ActiveX and Netscape claims its JavaScript is the path to a better world. The 4.0 versions of both products support the other vendors' technology, but not fully. For instance, you can open and view ActiveX documents in Navigator 4.0, but you need a plug-in to use ActiveX controls.

Furthermore, each vendor uses its own underlying infrastructure products differently. For example, "Microsoft makes certain platform assumptions," says Darryl Mataya, executive vice president of Cyberspace Financial Services, an Internet service provider specializing in financial institution site development. "It uses the underlying NT security so that if somebody logs on to a secure resource with Explorer, they pass right through. But if somebody logs on with Navigator, they'll be challenged for a password."

SUITE FEATURE COMPARISON CHART

	Vendor	Price	Platforms supported	Auto fill-in of URLs	Push channels	Offline browsing	HTML editor included	S/MIME e-mail	Create/send/read HTML e-mail	Operating system integration
Microsoft Internet Explorer 4.0	Microsoft http://www.microsoft.com	Free	Windows 95/NT*	Yes	Yes; CDF-compliant	Yes	Yes	Yes	Yes	Yes
Netscape Communicator 4.02	Netscape Communications http://www.netscape.com	$59 ($79 for Pro Edition); Navigator alone: $39	Linux, Macintosh 7.5 & up), Windows 3.x/95/NT, Unix (5 types, 9 versions)	Yes	Yes; non-CDF compliant	Yes	Yes	Yes	Yes	No

*Versions for Macintosh, Windows 3.x, HP-UX, and Solaris promised for future release.

By contrast, Communicator works tightly with Netscape's LDAP-centric servers. For instance, trusted Navigator users logging on to a Netscape server are not challenged for passwords and the Messenger mail client makes use of LDAP directories for its address book.

A hidden browser issue is compatibility with other infrastructure software. One IT manager claimed that a well-known commerce server from a third-party vendor doesn't work with IE 4.0 (which still was in beta at this writing). Before you invest heavily in specialized infrastructure products, make sure they work with all browsers.

Another administrative issue is modularity. Both vendors claim managers can install only the pieces of the client suite they want. Notably, however, Netscape requires you to install its Messenger e-mail client even if you don't plan to use it.

With regard to centralized administration and deployment of the suites, our IT managers agreed that the contestants are, overall, equal. Both products require you to obtain separate administration modules which allow you to configure and distribute the components remotely.

Winner's Circle: Dead heat. Both browsers work best with their own infrastructure software but now are interoperable with the other vendor's software and development environments.

E-MAIL

Essentially an afterthought in earlier versions, the mail clients and news readers that accompany both are now quite robust. So robust, in fact, that they've left many other, third-party products in the dust. (See "E-Mail Reinvents Itself," Nov. *IW*.)

Microsoft's Outlook Express and Netscape Messenger support SMTP, POP3, IMAP4, MIME, S/MIME, and HTML messages. Both have rules-based message routing to simplify local administration. Both are a breeze for end users to learn and use.

Some environments, however, favor Outlook Express. "We're committing to Exchange Server, and Outlook Express works with Exchange server," says an IT manager for a large pharmaceutical company. "So our answer is obvious." Specifically, you can import Exchange addresses and messages into Outlook Express.

Both these products have state-of-the-art security.

Winner's Circle: Photo finish. Both products handle Internet mail easily and securely, but Outlook Express integrates better with Microsoft's Exchange server and makes migration simpler.

GROUPWARE & COLLABORATION

Network-based collaboration is an increasingly popular method of boosting productivity. Netscape has a clear edge in this area. In particular, Communicator comes with the Collabra newsreader. If you invest in Collabra server software, it provides a rich and flexible environment for private threaded discussions. With custom development, IE 4.0's Outlook Express can take advantage of some NNTP servers' ability to control access to certain threads, thus enabling private threaded discussions in a rudimentary sense. But this requires more effort to implement and isn't as flexible.

For instance, Collabra's virtual threading feature lets users gather related threads from multiple discussions into a single thread—a handy feature that even Internet newsgroup readers would do well to copy. Further, like most of its other client products, Collabra server uses Netscape's directory services, which greatly eases administration and controlling users.

Communicator Professional also comes with Netscape Calendar, a decent group-scheduling program. However, at this writing, Calendar Server still doesn't work with Netscape's other directory services, a shortcoming the company promises to rectify.

Microsoft's NetMeeting and Netscape's Conference are roughly similar products and are becoming more useful for the enterprise environment. They support Internet telephony and application sharing, although only NetMeeting supports videoconferencing. Where once these tools only worked with others using the same product, both now adhere to the H.323 standard for communication with other compliant products. However, only NetMeeting supports the T.120 series of standards. Even though they are becoming increasingly useful for enterprise solutions, these products remain helpful primarily for isolated applications.

Winner's Circle: Netscape Communicator by a head. It's clearly more advanced—if collaboration through threaded discussions or group calendaring is desired.

SECURITY

Every passing month brings media reports of serious security breaches in one browser or the other. However, overall, both products are secure and both companies have

Internet telephony	Video-conferencing	Client and server authentication	Security control over active content	SSL 3.0 support	Group scheduling	Central administration	Web search from browser	IBM 3270 access and emulation
Yes (NetMeeting)	Yes (NetMeeting)	Yes	Yes	Yes	No	Yes	Query multiple engines; view results pages in separate frames	No
Yes (Netscape Conference)	No	Yes	Yes	Yes	Yes (Pro Edition)	Yes	Links to a search engine	Yes

<The View from the Developer's Trenches>

For users, these are exciting times: the new browsers from Netscape and Microsoft bring more features, functionality, and fun. But some thorny Communicator vs. MSIE decisions are cropping up for those who develop Web pages and applications.

While the two browsers are now functionally equivalent (good), the technologies used to implement their advanced features are diverging rapidly (bad).

The central questions for developers thus become: Should I develop advanced features for just one product, leaving people with the "other" browser to see less interesting pages? Should I wait and see whether one platform achieves dominance (and meanwhile risk being bypassed by my competitors)? Or should I spend the time/money to develop for both browsers?

My advice is to develop around MSIE 4.0 for Windows-only company intranets and around Communicator for the wilds of the internet. A few reasons for favoring Communicator include:

Platform Neutrality. Many of the advanced features in Microsoft's browser rely on technologies that function only in their native operating system. For example, ActiveX, the "glue" that holds MSIE's advanced features together, links directly into the innards of Win95/NT.

Scripting Languages. Scripts built into Web pages are really coming into their own, with many uses beyond rollover graphics and forms validation. Compared to Microsoft's JScript and VBScript, Communicator's JavaScript looks tough to beat: It is very powerful and works on just about every platform—including Windows 3.1.

Push Technology. Netcaster's API is implemented in the ever-popular JavaScript whereas Microsoft's implementation relies on a new file format called Channel Definition Format (CDF). While simple channels are relatively easy to build with either technology, sorry, Microsoft, what the world doesn't need right now is another file format.

Market share. Netscape still leads by a wide margin, and by unbundling the Navigator browser from the overall Communicator package it has shown that it is serious about retaining market-share leadership.

Then there's **Dynamic HTML.** It has huge potential, but, as elsewhere, the two browsers take mutually exclusive implementation approaches. Microsoft may have the better solution here, but the competing "standards" nonetheless remain a major headache for developers.

All in all, until some significant shift occurs in the market, I'll continue to recommend Netscape as the cross-platform Internet browser of choice for both for users and developers.

Daniel Gonneau, an Internet developer and consultant since 1994, runs Zephyr Networks (http://www.znw.com).

responded admirably to problems when they've arisen.

Both browsers support digital certificates to authenticate the client and server. Both support Secure Sockets Layer 2.0 and 3.0. No browser will ever be perfectly secure, but both these products have state-of-the-art security features and the vendors are committed to keeping it that way.

Internet Explorer takes an interesting approach with its security zones. These enable users or administrators to designate categories to which you can assign various Web sites. Each zone can have different security characteristics depending on your level of trust. For example, you may choose not to download Java applets or ActiveX controls from Web sites while allowing such downloads from the intranet. Netscape gives roughly the same capabilities to administrators.

Winner's Circle: Another photo finish. Microsoft's security zone approach may prove advantageous in the long run.

FINAL ODDS

Neither product emerges as a clear victor here. The view that Communicator 4.0 or Internet Explorer 4.0 taken as a whole will do a better job for your enterprise is simplistic. You'll need to examine your specific functional needs and plans and determine which one excels in the areas that are most important to you.

IT managers we contacted found no *significant* difference in browser functionality, interoperability, security, or centralized administration. Thus, if your primary need is simply to standardize on a single browser, Explorer is the obvious choice because it's free.

If pushing information to end-user desktops has a place in your technology plans, Microsoft has an early lead because of its support for CDF, which simplifies administering and controlling push clients. However, this is a quickly evolving area and Netscape's push technology works well if you are only pushing internal information in which CDF is not essential.

If collaboration is a priority, Netscape is the clear choice with its Collabra and Calendar clients. You'll need to purchase separate server software to implement either module, but that software integrates well with Netscape's other products.

Both suites provide fine e-mail clients, but if you are committed to Microsoft's Exchange server, Internet Explorer's Outlook Express is the better choice.

Finally, in view of the closeness of the race, some organizations are choosing *not* to choose. "Explorer is free, but Netscape has 70 percent of the market, so we can't ignore them, either," says an Internet services manager for a large multinational corporation. "It'll increase our workload, but we've decided to support both because we have both in our organization. We'll evaluate and revisit this decision in 12 or 18 months. In the meantime, it'll be user's choice." ■

David Haskin is a contributing editor to Internet World.

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CIRCLE NUMBER 7

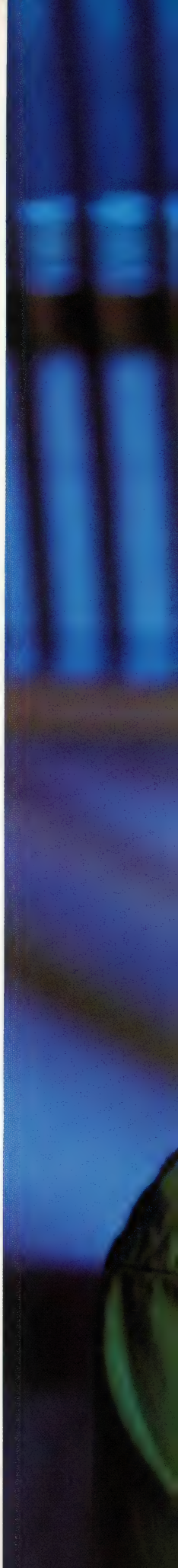
PRIME TIME

BY JEFF UBOIS

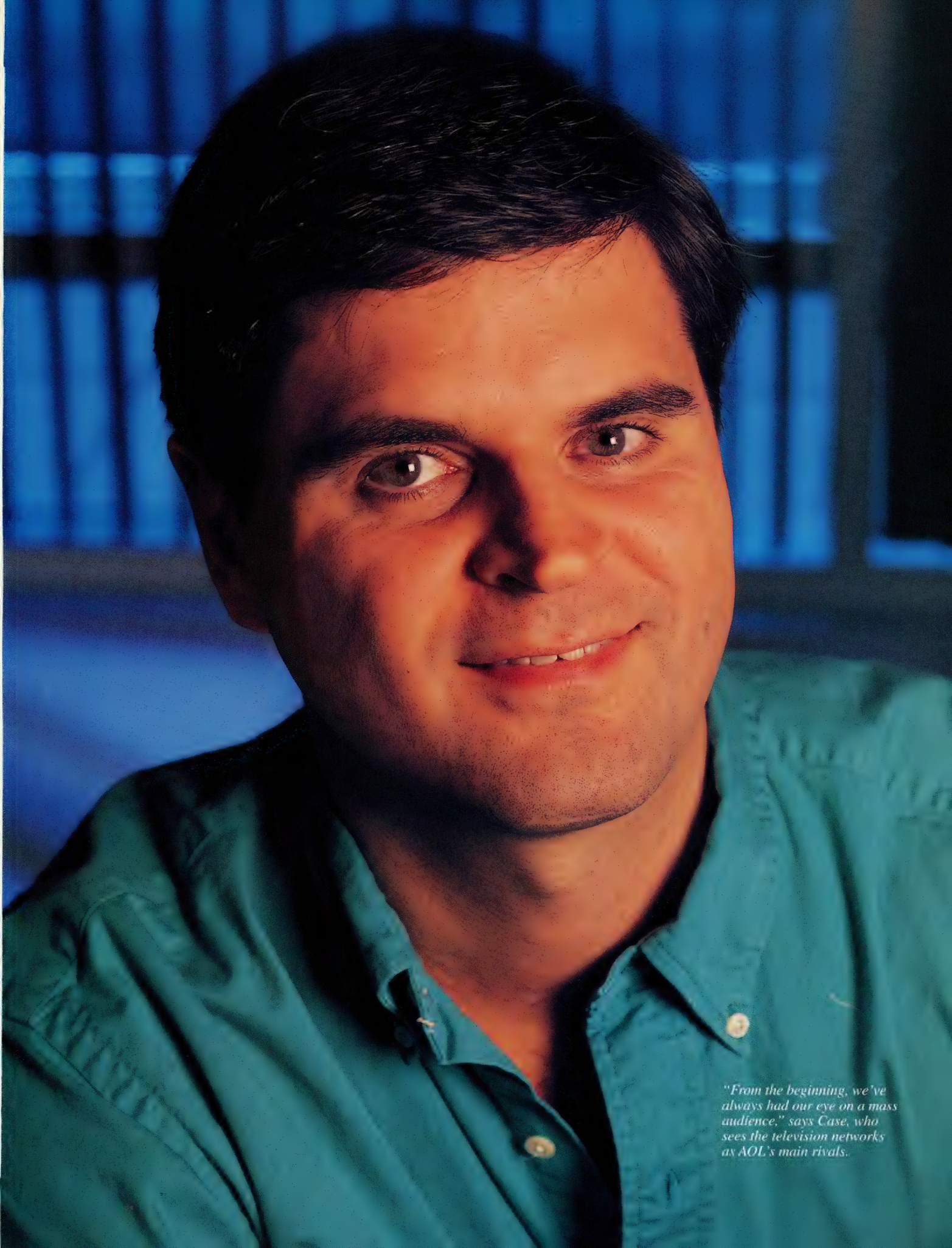
With a subscriber base at nine million and growing, Steve Case's AOL is well on its way to becoming the largest consumer audience anywhere, online or off.

Twelve years ago, a 26-year-old named Steve Case began pitching a new online service called Quantum. It was a tough sell, requiring all of the marketing skills Case had picked up at PepsiCo and Procter & Gamble. Case was far ahead of his time, describing a mass medium where people would chat and learn, without bothering to learn arcane computer commands. At the time, the Web was still on the drawing board, e-mail was the province of proprietary services like MCImail, and the typical online service was a bulletin board run out of a hobbyist's basement.

Case struggled for nine years to build the subscriber base to one million, renaming it America Online along the way. Though the Internet cognoscenti looked down on America Online as a newbie tool, once the Internet captured the imagination of the world, Case's service began to grow at a breathtaking rate. It currently has over nine million subscribers. Earlier this year, AOL



Photograph by Kathrine Lambert/AOL



"From the beginning, we've always had our eye on a mass audience," says Case, who sees the television networks as AOL's main rivals.

consolidated its position, buying CompuServe in a $1.2 billion deal.

Case has not shied away from the spotlight even as AOL endured a storm of criticism. When the company couldn't meet customer demand after it dropped its hourly rate plan in favor of a flat monthly fee, he took the heat, personally promising subscribers he would do better. To the surprise of many critics, AOL survived the crisis and seems stronger than ever.

Case's company is now living up to his original vision with a subscriber base surpassing the viewing audience for many top-rated prime-time network TV shows.

INTERNET WORLD: *What does the CompuServe acquisition mean for your end users, and what does it say about the direction you're taking with AOL?*

STEVE CASE: We're just trying to build a service that can reach a wide audience by being easy to use, fun, and affordable. We've made a lot of progress over the last few years in getting there, but there's still a long way to go: Somewhere between 15 and 20 percent of households in the United States are subscribing to an online service, which means more than 80 percent aren't.

The real challenge is to figure out a way to reach out to that wider audience, and we think that CompuServe allows us to provide a two-brand strategy and give consumers more choices. AOL is optimized for a mass-market audience, targeting people who are increasingly curious about this whole interactive world but really need simplicity. CompuServe is targeting a somewhat more sophisticated business and professional audience. By having two brands that are serving the needs of two somewhat different market segments, we can meet the needs of a wider audience.

We also recognize that there is a semantic confusion between the so-called online services and the so-called Internet service providers, and those markets have blurred together over the past couple of years. Our focus is on connecting subscribers from homes, but many other people connect from businesses or schools.



CIRCLE NUMBER 51

IW: *So how do you distinguish yourself from Internet service providers? What do you see as the future of Internet access?*

CASE: Internet access will continue to be a critical component of a larger package of services.

Two or three years ago, the markets were more separate; online services such as AOL did not have Internet access, and Internet service providers such as Netcom and many others did not really have any value-added services such as navigation or original content. In the last few years, we have built bridges between those two worlds. The technologies have blurred considerably; online services have done a good job of vetting the Internet experience, and ISPs are doing a better job of trying to provide more than just plain-vanilla access.

IW: *You sold ANS, and you subcontracted your modem pools to other companies. Some people suggested that's because you want to be a media company and not a dial-up company. Are you getting out of the networking business?*

CASE: Well, for starters, we're not getting out of the access business. Access is a crucial component of the overall offering we provide. And we continue to manage and control AOL.Net, which is our own TCP/IP network that has hundreds of thousands of modems deployed. Now, the actual deployment of those modems is in the hands of vendors that we have contracted with. ANS has been an arms-length vendor to AOL.Net for the past several years, even though it was an independent subsidiary of the parent company, America Online Inc. Now, once this deal closes, ANS will be a division of WorldCom.

The other two vendors are BBN, which is now a division of GTE, and Sprint. We're still in the access business. We still are in the AOL.Net business. We're just not in the business of building that plumbing infrastructure ourselves. We're also—by selling ANS—out of the business of selling connectivity solutions to large corporations. ANS really had two businesses. One was serving as a vendor to AOL.Net; the other was selling high-speed connectivity to Fortune 500 companies.

IW: *One of the comments that AOL Studios president Ted Leonsis makes is that your competition is television and family*

activities. Do you see yourself at war with television broadcast networks?

CASE: From the day we started this company back in 1985, we've always had our eye on a mass audience. We have always recognized that people today spend most of their leisure time watching television. When they come home at night, they have to decide whether they are going to turn on their TV or turn on AOL. So, therefore, we couldn't just think of AOL in terms of competing with other online services or even competing with the use of the computer to do other computer applications like word processing.

I think there is pretty clear statistical evidence, based on tracking the growth in AOL usage, that AOL is becoming more a part of everyday life for an increasingly large audience. And it's therefore quite reasonable to see competition become even fiercer in the years ahead between services like AOL and traditional TV networks like NBC and CBS.

IW: *People spending more and more time with AOL nearly melted your service a few months ago. Are your troubles over?*

CASE: The biggest crisis we had over the last year, which was certainly well publicized, was the problem with busy signals. It was triggered by us dramatically underestimating the amount of time people would want to spend on AOL when we switched to unlimited pricing. We thought usage on average would go up about 50 percent, and instead it went up more than 100 percent. It was a huge problem for us and a huge frustration for our members, which is why we've spent most of this year trying to do everything we can to fix that problem.

IW: *What is your role as a partner with content developers? How you are generating things that are unique to the AOL service as opposed to providing connections to things that are being broadcast over the rest of the Net?*

CASE: We have really organized the company in the past year to reflect some of the distinctions between some of the markets we are in. AOL Networks is the division that is focused on building the AOL brand, expanding the AOL audience, and so forth.

AOL Studios focuses on building original content for this interactive world. AOL Networks distributes AOL Studios' content and also works with hundreds of other content providers to create a unified offering.

In the past, traditional magazines like *Time*, which we worked with in the early days, were not in the online business. In a typical deal, they would create content for AOL that would be distributed exclusively on AOL. More recently, these companies are creating their own Web sites and the model has shifted a little bit because they can sell more advertising if they have a larger audience. So, increasingly, they are willing to pay us to promote their service.

IW: *You just did a deal with Microsoft where you get some active channels and they get an audience for Slate, but it appears to be your main enemy. What is your relationship with it?*

CASE: It is our major competitor and we recognize that historically, Microsoft has really hit its stride with the 3.0 release of its products. Windows 1.0 was a disaster; Windows 2.0 was a bit better but still a disaster, and Windows 3.0 changed the world. History suggests when Microsoft ships MSN 3.0, it will really hit its stride, and it

THERE ARE THOUSANDS OF ENTREPRENEURS WHO BELIEVE IT'S THEIR DESTINY TO PUT AOL OUT OF BUSINESS.



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is gearing up to do that next year.

As a result, everything else we do with it is done carefully with some ambivalence and some fear. Slate is an example of a service it has built that desperately needs a wider audience, so we worked something out with Microsoft to help drive an audience to Slate. In exchange, AOL was positioned well in the whole active channel world that it is developing. Microsoft is a formidable competitor in this market. In the last few months alone, it has placed a billion-dollar bet on cable modems and a half-billion-dollar bet on WebTV. So we need to make sure we are ready for it.



Case sits warily when he partners with Microsoft. "Microsoft is our major competitor," he says. Everything we do with it is done carefully with some ambivalence and some fear."

IW: *How about WebTV? Is the idea of access to AOL via non-traditional devices interesting to you?*

CASE: We are interested in pursuing new directions, whether they be TV appliances like WebTV or others, such as personal digital assistants.

In terms of WebTV, the first-generation product was remarkably well-designed, well-priced, and well-marketed, but the consumer experience was mediocre. I found it boring to use. The next generation shipping this Christmas is substantially better. But the markets around Web appliances and broadband access are going to take a few years to develop.

IW: *How long before your customers will have access via cable modems or ADSL?*

CASE: We've done some cable modem testing, and as part of our alliance with WorldCom, we're working to build ADSL into AOL.Net. The problem is that despite all the hoopla from the cable industry, remarkably few cable systems are presently equipped to handle broadband access. So it's going to take time before it's close to being a national phenomenon.

IW: *The search-engine and directory companies are emulating your model, adding chat, instant messaging, channels, and so on. How will you compete with them?*

CASE: Well, to some extent I guess I'm flattered by the fact that everybody now wants to be AOL. Our vision was not appreciated two or three years ago.

Every morning when we wake up, we have to reflect on the fact that the world's largest, best-financed media, communication, and software companies are all trying to eat our lunch; it's enough to give you a stomach ache. There are thousands of entrepreneurs all over the world who believe it's their destiny to put AOL out of business. So this has been an intense and competitive market that's only going to become more competitive in the years ahead as the communication giants really hit their stride.

IW: *Nobody seems to have really nailed the problem of search and navigation. Are there any promising approaches to the problem that you're trying out?*

CASE: Search is a piece of a much broader puzzle, and the challenge here is to make it easy for people to find stuff they are interested in. Sometimes they will want to do that through search, but most of the time they will want to do that through channels. We think it's best to organize services based on channels, so there's a sports channel, a news channel, and a finance channel, and within each of those channels the services then meet the needs of that particular market segment.

IW: *The encryption legislation pending on Capitol Hill could really change your business. The latest versions of the bill would require you to provide law enforcement access. How will that affect you?*

CASE: It's very complicated. I feel some sympathy for some of the people, such as the FBI director, who is really trying to minimize terrorism and other kinds of acts. You can't help but be sensitive to that. But at the same time, his approach, while well-intentioned, is naïve. The Internet is a global phenomenon and it doesn't really matter what this country wants to do. It really matters what everybody in the world wants to do. Terrorists will just use encryption systems or software from other countries. It's a difficult issue, but the United States has to join with other countries to remove the restrictions on the export of encryption technologies.

IW: *Chat used to be 30 percent of your usage. How do you see chat and instant messaging services evolving?*

CASE: We've always recognized that people fundamentally like to talk to each other. So community has always been the bedrock of what AOL is all about. And chat and instant messages, and more recently, buddy lists, help build that sense of community.

IW: *Any thoughts for investors in AOL? You started up the disk mail-out again, and you've acquired a lot of end users in the CompuServe deal. Can you make money at $19.95 a month over the long term?*

CASE: In recent quarters we've showed profitability, and we've already demonstrated that our business model works. The challenge is to continue to build the advertising and commerce revenue stream that will be the profit-driver not just for us, but for all companies in this industry. ■

Jeff Ubois is a contributing editor to Internet World.

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SEARCH

BY DAVID HASKIN

WEB SEARCH ENGINES ARE SMARTER AND STRONGER THAN EVER. WE TEST SIX OF THE BEST.

To get gold, you must sift through mounds of raw ore. To find valuable nuggets of information on the Internet, you've got to sift through an almost unfathomable number of Web pages—which explains the popularity of Web search services. These sites are information refineries, helping us quickly distill useful material from the mountains of digital dross that comprises the Internet. Search engines also are intensely competitive products, trying to win your loyalty both with fast-and-furious marketing campaigns and by constantly improving their technology. The hot search engine of last year is not necessarily this year's best. Search engines also compete with directories, like Yahoo!, which organize sites by subject categories instead of listing them in an order based on how relevant they are to your search terms.

All search engines use the same basic technology: "Spiders" automatically roam the Web looking at the contents of every Web site they have the resources to find, making copies of at least some of the contents. Indexing tools digest this gathered material so that when you conduct a search, relevancy ranking software can prioritize the sites. Although the underlying technology is similar, each search engine implements it differently.

SPIDER TECHNOLOGY

Spider (a.k.a. robot or 'bot) software perpetually crawls from site to site, taking a complete measure of the Web. Once it finds a new site or one that has changed, it sends material back to the search engine. While some spiders grab every site they find, others prioritize their efforts by determining a site's popularity or how frequently it has changed. The assumption here is that popular and frequently changed sites are more likely to be the most useful.

Photograph by Jean-Marc Giboux

Deciding whether to be selective or all-inclusive is tricky. Say an undiscriminating spider finds a site that hasn't been updated in two years and sends back 60 pages for indexing. This could clog your search results lists with time-wasting, out of date pages. On the other hand, old information isn't necessarily bad; there might be valuable data hidden away on that old site.

INDEXING

It would be untenable for search engines to examine all Web sites every time you conducted a search. Instead, search engines use indexes, which list the words contained in as many as 100 million Web pages, as well as other information about the sites. Each item listed in the index points to the resource in which it is located. When you run a search, the engine consults its index and displays a list of all sites that match your query—together with links to those sites.

Indexing technology isn't new, but each search engine has its own implementation—primarily at the spider stage. Some engines, such as AltaVista, Excite, and Infoseek, have their spiders send back every word in a Web site for indexing. Others return only a portion of the text in a Web site—just the first half, for example.

As with spidering, indexing more data may either waste your time with nonproductive results or unearth nuggets of information hidden deeply in obscure sites.

RELEVANCE RANKING

Let's say that our broad search for "bicycle" nets 25,000 Web pages. Obviously, that's too many sites for you to wade through in order to find the specific information you want.

To address this problem, search engines try to determine which sites are most relevant to you. All engines display the most

BRIGHT FUTURE

Smarter Searches Ahead

Search engine vendors insist that the future's so bright that shades will be *de rigueur*. The future indeed may be bright, but search engines will evolve at a modest pace over time, experts agree. The simplest, but potentially most useful, changes will be in the search engines' interfaces. The challenge, according to Don DePalma, an analyst for Forrester Research, is to "create a universally understandable visual metaphor" for displaying results instead of the current text-heavy interfaces.

Beyond that, expect greater efficiency in compiling and perusing search results. DePalma and other experts say search engines in the future will remember your interests and use that information to interpret your requests.

"If I search for 'bridge,' it could mean a physical bridge, a covered bridge, a piece of computer equipment—or the word *bridge* can even be a verb," DePalma says. "The search engine has to be smart enough to recognize the context of what I want."

One way to attain this efficiency is by using intelligent agents. "We all are experimenting heavily with agents," says an executive for one major search engine site. These agents not only will search based on your previous interests, but also will periodically update those searches and notify you of relevant new pages. Simple forms of this technology already are at work at sites such as Firefly (http://www.firefly.com) and WiseWire (http://www.wisewire.com).



Gregory Grefenstette, project leader in multilingual text mining at Xerox Research Center in Grenoble, France, says that future search result lists will be quite different. "You won't get back a list of documents, but an analysis of how the words are used," he says.

Specifically, natural-language processing will return results to ambiguous searches that resemble book indexes. Such results will help you clearly see how search terms relate to other words. If, for example, you search for "research," you'll quickly be able to discern which pages are about "research grants," "research assistants," or "market research."

Grefenstette also looks for greater ability to conduct multilingual searches, which is his area of specialty. "By the year 2000, 50 percent of Web content will be non-English," he says. "Look for cross-language information retrieval, which takes the query, identifies the language, and produces queries in different languages." AltaVista already has a crude version of this capability, which enables you to search for pages in specific languages. Translating actual pages, however, still will have to be done locally because of the processing load.

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relevant sites at the top of the search results list. They also provide additional cues, such as a numerical ranking.

Again, search engines use different techniques for determining relevancy. One common technique is to count the number of times the search term appears. The logic is that if the word "bicycle" appears repeatedly, it's more likely to be on that topic than a page with just one instance of the word.

Some search engines weigh how often the search term appears in the first *n* words of the document, the reasoning being that documents are more likely to be relevant if search terms appear higher. If your query includes multiple words, the search engine may consider how closely together those terms appear.

FLESHING OUT FINDS

Besides relevancy rankings, all engines provide at least some textual description of found sites. These are essential for determining whether a site meets your needs.

Some sites create the descriptions by using the first *n* characters of the document, which sometimes results in the display of meaningless information such as menu options. Others, such as Excite and Lycos, use their own technology to extract key words and phrases that describe the site. These techniques employ linguistic analysis to ferret out important words.

Still other sites use the HTML <META> description tag in which the site developer describes the site. Where developers are conscientious, this is useful. If the description is missing or poorly written, the citation in the search results is not useful.

ENGINES OF CHOICE

The search engine business moves quickly. For example, WebCrawler (http://www.webcrawler.com) was one of the first search engines to appear and we included it in our last roundup. It's still around, but it's no longer competitive so we left it out. Moreover, new search engines seemingly appear every week. However, we didn't include new search sites unless they offered something unique and useful, or unless their capabilities compared well with the established search engines.

The six sites we review are the top dogs; the ones that give the best overall results on a variety of searches. They're not equal: Some find more information than others, and some offer more non-search services. But each has something valuable to offer.

Best of Test

BEST OF THE TEST iw Labs

ALTAVISTA

AltaVista is unquestionably today's most powerful search engine, consistently finding more documents than any other we tested. Its interface is also greatly improved. Accordingly, it earns our Best of Test honors.

But other products are worthy of mention in this winner's circle, too. HotBot is both quite powerful—second overall in search prowess to AltaVista—and the easiest search engine to use for framing complex queries. For those who prefer to use only one site for finding information, Infoseek is an excellent choice. Its search power is close to that of AltaVista and HotBot, its interface is simple, and it includes a 500,000-entry directory.

The most promising—and innovative—product is Northern Light. It performs well as a Web search engine today and should improve as its index grows. More important, it provides access to a unique collection of one million articles from 1,800 publications, many of which you won't find anywhere else on the Web. You'll pay for the full text of these articles, but we often found it worthwhile.

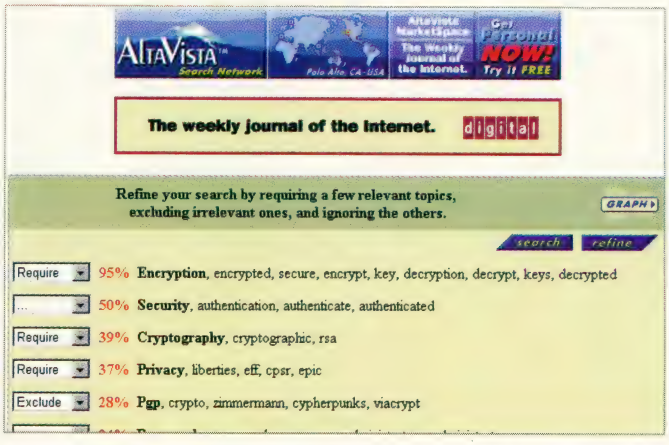
THE REVIEWS

AltaVista

HTTP://WWW.ALTAVISTA.DIGITAL.COM

In a dramatic, last-minute turnaround worthy of *The Karate Kid*, AltaVista has recaptured its crown as monarch of brute-force searches. Just before we went to press, it released to the public a new index that digests 100 million pages, roughly twice as many as its chief competitors. Test results were commensurate: AltaVista consistently found more Web documents—often many more—than HotBot, its closest rival.

There's more good news, too. AltaVista's interface, which formerly was a bit of a garbled mess, is much improved (though still not quite as easy to use as HotBot's). The home page now contains only a search form, an ad, and standard menu options. Similarly, its search results screens are far less cluttered and easier



After you've run an AltaVista search, this form helps you refine it by specifying words to include or exclude.

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CIRCLE NUMBER 8

to navigate than before. Its relevancy rankings proved reliable in our tests, though its site descriptions often weren't useful.

AltaVista is trying some innovative approaches for refining searches. The most successful of these attempts occurs after you search, then click the Refine button. A series of words gleaned from found documents appears; you can elect to exclude or "require" each of these associated terms in a subsequent search. Among the refining words for our search on "bicycle" were "racing" and "helmet." Refining the search with those words helped find pages that discussed issues related to racers wearing helmets.

There's also a flow chart that graphically summarizes search results, letting you choose among words associated with the top-level key words found at the site and include these in subsequent, refining searches. Overall, we found this feature less useful as it was somewhat time-consuming and imprecise.

AltaVista has added an advanced search page in which you can frame complex Boolean operators. You can perform proximity searches as well as search for pages changed within a specific timeframe. Another unique feature allows you tell AltaVista to attach added importance to specific words when creating its relevancy rankings. However, you still must master its obtuse search syntax to create complex searches.

AltaVista's usability has improved to the point that it's now on a par with that of most other search engines—although, again, it still doesn't match HotBot's friendly forms-based approach. Nonetheless, AltaVista has clawed its way back to the top spot when measuring raw search power. If AltaVista can't find it, there's a high likelihood that it's not on the Web.

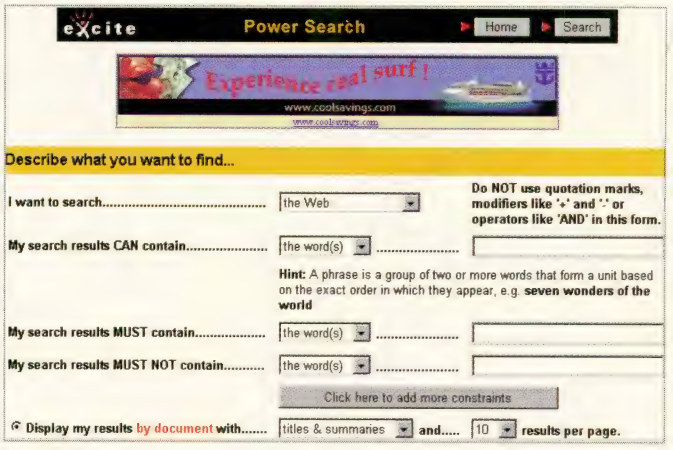
Excite

HTTP://WWW.EXCITE.COM

Excite's 50 million indexed pages match the numbers found at other leading search engines, but its search results were consistently in the bottom half of the group. Nonetheless, Excite still offers a lot. For instance, we appreciated its ability to search for concepts: A query for "martial arts" finds sites about *kick-boxing* and *karate* even if the original search term isn't in the page. After a search is done, Excite suggests words for narrowing the query. A search for sites about the Zen poet Basho suggested we also add the search term "haiku," an astute suggestion. Unfortunately, the feature didn't always work this well. After conducting a broad search for "bicycle," among the words it suggested adding to refine the search were *bicyclists*, *bicycles*, *bike*, and *biking*.

Power searchers will appreciate the appropriately named Power Search page, a forms-based aid that lets you quickly create Boolean searches. Like Infoseek, Excite also does an excellent job of helping you after you conduct a search. Besides its suggestions for further narrowing the search, if you find a page that appeals to you, clicking on a link automatically finds more pages that are similar to it.

We found Excite's relevancy rankings to be solidly accurate, although we disliked its site summaries. Excite draws its



Excite's Power Search page simplifies the creation of Boolean and other complex search queries.

summaries from text within the page, but not necessarily from introductory text. The descriptions often mirrored the second, third, or fourth sentence on a page, which often weren't descriptive.

Excite has a directory of 140,000 Yahoo-style listings, which pales compared to Infoseek's 500,000 directory listings. And it doesn't offer much brute search power. However, it does make searching—and refining searches—simple, and its excellent relevancy ranking helps you home in on useful information.

HotBot

HTTP://WWW.HOTBOT.COM

In the topsy-turvy world of Web search services, HotBot unseated AltaVista as the champ a few months ago when we evaluated the services for iw.com, only to be bumped by AltaVista in this roundup. Still, HotBot is a powerful and easy-to-use site that consistently came in second behind AltaVista in our test searches. Most notably, HotBot claims to



The greatest of HotBot's many strengths is the power and ease of its interface for building complex queries.

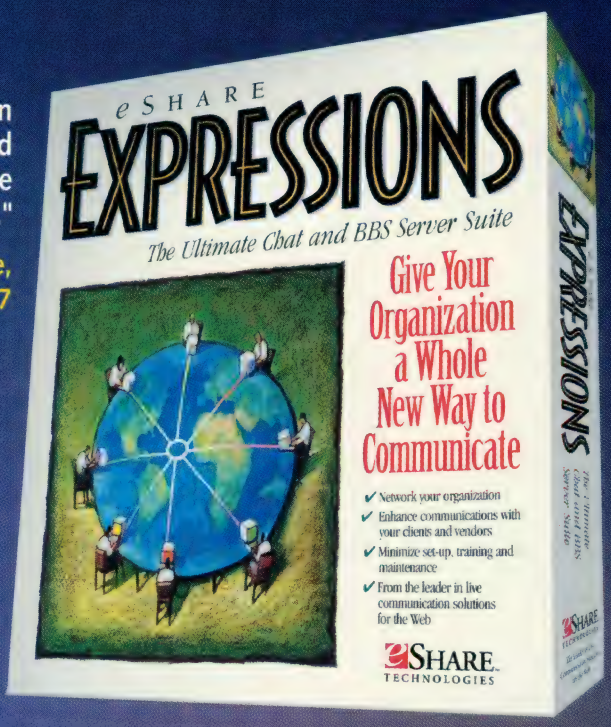
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reindex its approximately 54 million pages every two weeks! That proved out in our tests: Sites that had been updated in the last 10 to 14 days consistently turned up in our HotBot searches but not in searches of the other engines.

Moreover, HotBot's advanced querying capabilities are, along with AltaVista's, the strongest in the group. It will return exact matches to your query or near matches. You can limit your search to specific domains (such as .com or .org) and to specific geographic locations. It can even find items embedded in Web pages like ActiveX controls, Java applets, and specific types of images.

Our favorite HotBot feature is a search modifier that searches only for pages that have changed within a specified period of time, ensuring timely results. You also can search a site to a specific depth (three pages deep, for example). In addition, you can save searches for later reuse.

HotBot's customizable forms-based interface is, in our view, the easiest to use of any search engine. You type your search term and then select how to modify it from a drop-down list. You can click on icons to display additional forms in which you apply advanced searching techniques such as querying by domain.

HotBot's relevancy ranking is generally good but not the best. In our tests, it sometimes wasn't clear why certain pages turned up at the top of the list. Its site descriptions generally were useful, but not always. HotBot pulls its descriptions from the <META> description tag or, when that isn't present, from the top headings. This sometimes results in descriptions that are gibberish.

For now, HotBot claims the silver medal for power searching. Its directories, which are due for some work, proved anemic in our tests. But when it comes to finesse, HotBot—and its easy-to-use forms for framing searches—has no equal.

Infoseek

HTTP://WWW.INFOSEEK.COM

Infoseek is both broad and deep. It was a close third to AltaVista and HotBot in overall search power, and it is chock-full of amenities, such as an extensive directory. Infoseek claims approximately 60 million indexed pages,

FIND IT FASTER

Power Search Tips

Despite all the computer science behind today's search engines, effective searching remains largely a human art. It's easy to find reams of info on the Net; the trick is to create searches that find precisely what you need. Here are some tips:

- Beware of search terms with double meanings. For instance, "web spider" might refer to what arachnids spin or to an Internet technology.
- Be precise. Search for "carburetor repairs," not "car repairs."
- If you find it hard to be precise, use search engines such as Infoseek that makes it easy to refine and narrow your searches as you go along.
- Don't assume that the big search engines are the best. You may find what you need faster by using specialized search engines. For instance, for information about carburetor repairs, try a site like Click and Clack's CarTalk (http://cartalk.com).
- The syntax and procedures for creating searches vary from service to service. Stick with a favorite search engine and master its nuances.
- Master Boolean logic. It uses the operators "and," "or" and "not" to narrow searches. Each engine uses slightly different syntax for Boolean searches,but here are some examples of how Boolean logic works:

1. "Finches" *or* "woodpeckers" finds all pages that mention either of those birds.
2. "Finches" *and* "woodpeckers" finds pages that include both types of birds.
3. "Finches" *and* "woodpeckers" *not* "crows" finds pages including information about finches and woodpeckers but not crows.

SPECIFIC TIPS FOR SPECIFIC SEARCH ENGINES

AltaVista: Use its power search window to construct complex Boolean queries. Click the Refine button to view a list of words commonly found in the search results. You can refine the search by including or excluding any of those words from a subsequent search.

Excite: The "More Like This" feature finds additional pages similar to a found page that meets your requirements. Also, use its Power Search page for fine-tuning searches.

HotBot: Find only up-to-date pages by limiting the search to those pages that have changed in the last three or six months.

Infoseek: After you complete one search, search within those results. Do that by constructing a new query and clicking on the "Search These Results" button.

Lycos: The Lycos Pro page finely tunes how it ranks found items for relevancy.

Northern Light: Search the Special Collections as well as the entire Web. This turns up documents in publications that aren't otherwise available on the Web.

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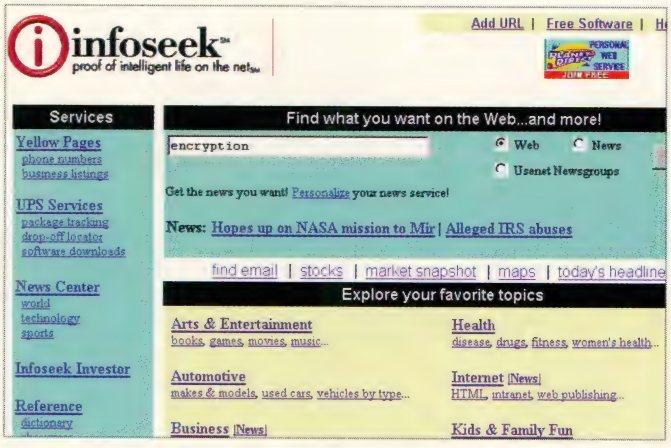
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Features Comparison

SEARCH ENGINES

Product	AltaVista	Excite	HotBot	Infoseek	Lycos	Northern Light
URL	http://www.altavista.digital.com	http://www.excite.com	http://www.hotbot.com	http://www.infoseek.com	http://www.lycos.com	http://www.nlsearch.com
Indexed pages (millions)	100	50	54	60	30	50*
Searches Usenet	Yes	Yes	Yes	Yes	No	No
Searches gopher space	No	No	No	No	No	No
Searches FTP sites	Yes	No	No	Yes	No	No
Natural-language queries	Yes	Yes	No	Yes	Yes	No
Enhanced query forms	Yes	Yes	Yes	No	Yes	Yes*
Searches within date range	Yes	Yes	Yes	Yes	No	Yes*
Categorizes results	Yes	No	No	No	No	Yes
Searches within existing results	Yes	Yes	No	Yes	Yes	No
Web-site directory	No	Yes	Yes	Yes	Yes	No

* Product was still under development at testing time; this feature is expected by the time this review appears.



Infoseek offers excellent one-stop shopping: strong searching, directories, and an easy-to-use interface.

and our tests confirmed that it typically found almost as many pages as HotBot and AltaVista. You can use its natural language query capabilities, but for greater precision, you must learn its somewhat complex advanced search syntax.

If you do take the trouble, you'll be amply rewarded. You can, for example, search not just for words but also for sites with links to specific URLs. This enables you to perform tricks like searching for all sites with links to your site.

Previously cluttered and confusing, Infoseek's interface is now well organized and easy to navigate. Infoseek also provides the best set of post-search options. To the left of the search results is a column with three headings. Best Bets lists interesting sites that closely match your search criteria. The Related News heading displays recent news stories about your search term. Related Topics lists similar topics. This was sometimes useful, sometimes not: A search for "cherry torte" listed "desserts" and "chocolate" as related topics, but a search for "meaning of life" found "Renting vs. buying" and "Baseball in Japan" as related topics.

In addition, you can easily refine your searches by specifying new criteria and searching again within the initial results set. For instance, our search for "bicycle" turned up more than 126,000 hits. A subsequent search within that group for "tire repair" found more than 3,000 Web sites and Usenet postings about that subject.

Infoseek doesn't have quite the search muscle of HotBot or AltaVista and its descriptions of found sites often were gibberish compared to Northern Light's and HotBot's. However, Infoseek's myriad other services such as its generous Web directory, access to the news, and its yellow and white pages directories, make it the strongest choice for those who prefer one-stop shopping.

Lycos

HTTP://WWW.LYCOS.COM

Lycos isn't the most powerful search engine, but it is the most highly customizable—and it does a solid job of combining Web search and directory services. Its customization capabilities let you fine-tune how its relevancy ranking works. You access this feature from Lycos Pro (the advanced search interface). You can set it, for instance, to rank documents in which search terms appear in the title more highly than other documents. Besides tweaking the relevancy ranking, you can conduct the actual search from Lycos Pro.

Lycos also provides an extensive number of ways to create and modify searches, including proximity searches and setting the order in which search terms must appear in the documents. You can perform natural-language queries such as, "What is the meaning of life" (which, happily, turned up 43,668 responses). However, unlike the other very customizable search engine reviewed, HotBot, Lycos doesn't let you search based on when pages were last modified.

We found Lycos' relevancy ranking consistently to be the strongest in the group. However, its method of extracting

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He can script Internet hyperlinks for your Web site.
He thinks retained earnings is when he finds change in his washer at the Laundromat.



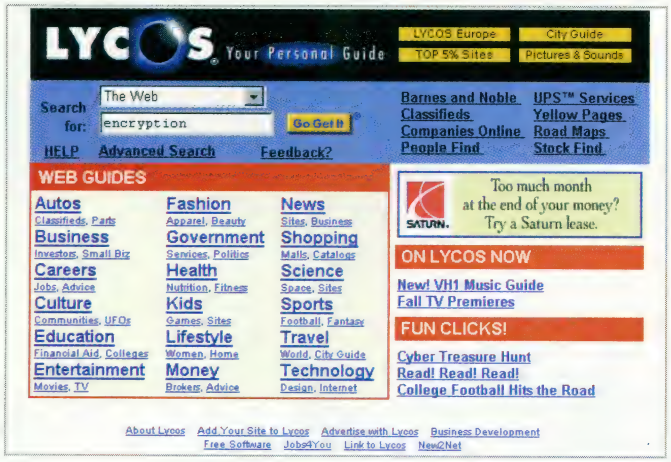
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CIRCLE NUMBER 17



Lycos isn't the strongest search engine, but features like reviews and directories add plenty of value.

descriptions from text in the documents often failed to tell us clearly what the site contained.

Despite its flexibility in modifying searches and results, Lycos didn't find as many documents as most of the other search engines. Lycos boasts it has indexed 100 million separate URLs and that it rebuilds its index every two weeks. URLs aren't pages, however, and Lycos failed to match HotBot's ability to find recently updated information.

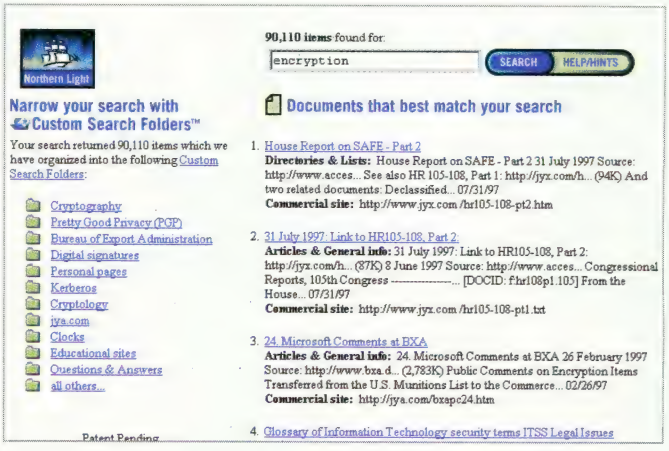
Nonetheless, we like Lycos because of its useful mix of features. Its staff of reviewers has specified a number of Web venues as "Top 5 percent sites." Not only can you read and enjoy the reviews themselves, you can run searches strictly within the reviewed sites if you wish. Lycos also has an extensive site directory, as well as news, weather, sports, and the ability to find businesses and people. Power searchers will probably prefer other services, but Lycos still is attractive if you like many Web services in one place.

Northern Light

HTTP://WWW.NORTHERNLIGHT.COM

Northern Light is the newest kid on the block and should quickly gain popularity. Its search prowess already is strong and its unique features make it more useful for serious researchers than the other search sites. Northern Light had been available to the public for only a month when we tested it, yet its results were solidly in the middle of the pack, with particularly strong results on searches for obscure sites. A spokesman said search results would improve over the coming months as the number of indexed pages climbs from 38 to 50 million. The quality of its relevancy ranking and site descriptions were excellent.

Besides serving as a Web search engine, Northern Light also aggregates and serves the content of about 1,800 publications,



Northern Light's custom search folders automatically narrow a search by grouping sites with similar content.

DIFFERENT STROKES

Alternative Road Maps

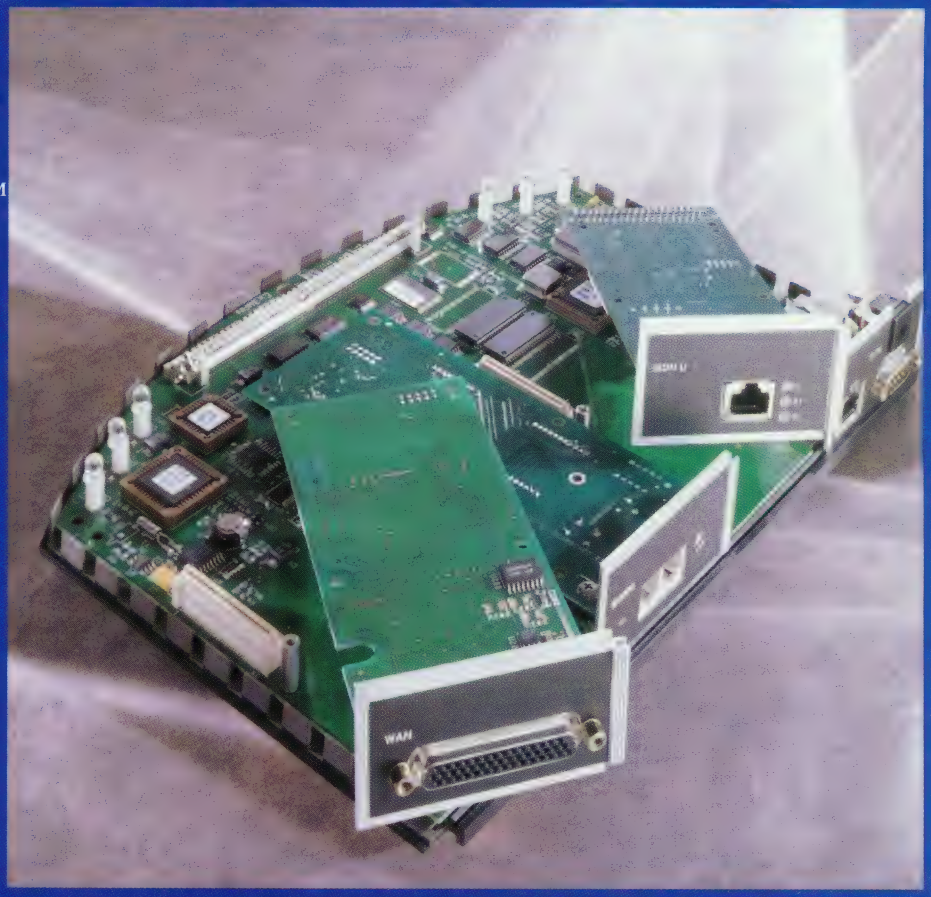
Besides search engines, many people like to use directories and meta-search engines for finding informational needles in the Web haystack. Rather than index Web pages, directories use humans to find and categorize new Web sites. Using a directory is akin to browsing through a specific section of a library; search engines are similar to scanning the content of all the books in the library. Currently, Yahoo (http://www.yahoo.com) lists 650,000 Web sites in its directory; some search engines have indexed the contents of 50 million pages or more.

Meta-search engines don't perform indexing and searches themselves, but rather use other existing search engines. These tools come in two flavors. Some, such as Search.com (http://www.search.com), act as directories and front ends for other search engines. Search.com lists and enables you to search 100 different sites ranging from the general-purpose engines reviewed here to a number of quite specialized ones.

Other meta-search sites, such as Mamma (http://www.mamma.com), simultaneously search multiple general-interest search engines and report the results. These sites typically don't offer as many search refinements as individual search engines, but they can be quite useful for broad, brute force searches.

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many of which aren't available elsewhere on the Web. You can search the entire Web, its special collection of publications, or both at once. For items found in the special collection, Northern Light provides a free article synopsis. Viewing an entire article costs as much as four dollars, with a typical charge being a dollar.

Northern Lights' unique custom search folders are an often-successful attempt to categorize found documents. Northern Light places found documents into categories and subcategories that it displays as an outline.

The feature worked best when the search terms were ambiguous. For instance, we performed a search for "web spider" and Northern Light returned articles about both insects and the technology used by Internet search engines.

Custom search folders made it obvious which were which and thus saved a lot of time. This system isn't infallible, though: One of the initial subgroups to our search for bicycle was "rhythm & blues."

Still, Northern Light is onto something significant. We found many of the extra-cost publications to be specialized enough to be truly useful. For example, we found excellent articles about forest management that weren't available elsewhere on the Web. Combined with its already strong search engine, this makes Northern Light an excellent choice for serious information miners. ■

David Haskin is a contributing editor to Internet World.

The Test Pattern

The IW Labs searches were designed to test the degree to which each site was comprehensive, the quality of search results, and overall usability. Some searches were broad, with the goal of gathering a large number of responses. Other searches were based on obscure topics, where relatively few results were expected, in order to determine the depth of the underlying database.

We examined relevancy ranking by visiting each of the first 10 sites found and noting whether the Web page was actually on the search topic. We also tested whether the search engines found recently updated pages.

More subjectively, we evaluated the interface and output of each search engine. We were particularly interested in how easy (or difficult) it was to construct Boolean searches and how easy it was to search within found documents. Finally, we rated the readability of search results.



CIRCLE NUMBER 224

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Cisco Series 4000, Cisco Systems

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WebTV, WebTV Networks

Outstanding Consumer Software Product
Eudora 3.0, Qualcomm

Outstanding Promotion of the Internet
MCI Telecommunications Corp.

Individual Achievement
John Gage of Sun Microsystems

Best of the Internet
Microsoft ActiveX

1996 INDUCTEES

Outstanding Software Product
Progressive Networks, RealAudio

Outstanding Hardware Product
MicroTouch Systems, WebStation

Outstanding Service
Digital Equipment Corporation for Alta Vista

Outstanding Consumer Software Product
The American Civil Liberties Union (ACLU) for its challenge to the Communications Decency Act

Outstanding Achievement
Sun Microsystems for Java

Best of the Internet
Java from Sun Microsystems

1995 INDUCTEES

Outstanding Software Product
Navigator 1.1, Netscape Communications Corp.

Outstanding Hardware Product
IBM SOHO Assistant, Rockwell Communications Nethopper

Outstanding Service
Jerry Chih-Yuan and David Filo for Yahoo!

Outstanding Consumer Software Product
Mike Godwin, Electronic Frontier Foundation (EFF)

Outstanding Achievement
Philip Zimmerman for Pretty Good Privacy (PGP)

Best of the Internet
Yahoo!

1994 INDUCTEES

Outstanding Software Product
Marc Andreessen

Outstanding Hardware Product
Telebit Corporation

Outstanding Service
Alternet/UUNet

Outstanding Marketing
Digital Equipment Corporation

internet WORLD

WEBWEEK

Sound Effectiveness

LiveConnect adds audio—and value—to your Web pages. **BY AARON WEISS**

Long before sound effects became fashionable in Windows 95, precocious Macintosh users had configured their desktops so that every click and drag was connected to a boom and a bang. And while these relentless sound attacks quickly grew irritating to those within earshot, the concept of providing customized audio feedback to your Web site's visitors is an intriguing possibility—and an excellent way to increase repeat visits.

This month we'll look at JavaScript's LiveConnect facility, which we can use to trigger sounds in response to various Web-page events, such as when the user clicks a button or passes the cursor over an image. Although LiveConnect is supported only by Netscape Navigator 3.0 and higher, we'll also quickly summarize how similar effects can be achieved for Internet Explorer users.



Screen 1: By using the LiveConnect feature to link the LiveAudio plug-in with JavaScript, even a simple Web page can sound like the cat's meow.

EXAMPLE 1: EMBEDDING SOUND

```
<EMBED SRC="pipspeak.wav"
HIDDEN=TRUE
VOLUME=0
NAME="pipspeak"
MASTERSOUND
AUTOSTART=TRUE>
```

LiveConnect, as implemented by Netscape, is simply the means by which JavaScript can "talk" with an external object such as a Java applet or embedded plug-in. Java applets are included in a Web page using the HTML <APPLET> tag, while plug-ins are included using the <EMBED> tag. This month we'll consider how LiveConnect links JavaScript and a plug-in; in a future column, we'll see how JavaScript can converse with Java applets.

Plug-ins, put simply, are external programs designed to handle a particular type of file format—for instance, the QuickTime plug-in plays video clips saved in QuickTime format. Our focus, however, is the LiveAudio plug-in, which is included in a Netscape Navigator installation. LiveAudio, as its name implies, plays audio files such as those in WAV or AU sound formats.

To make the LiveAudio plug-in available to JavaScript, we must first embed a sound file in our Web page. Do this using the <EMBED> tag, as seen in Example 1.

We embed a sound file named pipspeak.wav. (Because we didn't choose to specify a full URL for the file, it is assumed to reside in the same directory as the HTML for the Web page.) Several parameters for the LiveAudio plug-in's behavior are also specified: The LiveAudio user interface is hidden, the volume is set to zero (silent; we'll see why a bit later), and this particular embedded sound is assigned the name pipspeak. The mastersound parameter is required because each embedded sound file is an independent object, and finally we have set the autostart parameter to true. In doing so, the sound will play once when the page is first loaded.

When the page containing Example 1 is loaded, the LiveAudio plug-in will "awake." More specifically, there are several things we can say to LiveAudio using JavaScript, as seen in Example 2 (following page).

To call one of the above LiveAudio methods from JavaScript, use the general syntax document.embeddedName.method(). Therefore, to call the LiveAudio play() method from JavaScript for pipspeak, use the syntax document.pipspeak.play().

You can embed as many sound files as you want in the page and control each using this LiveConnect syntax. LiveAudio provides additional JavaScript methods (for a full rundown, see Netscape's LiveAudio documentation at http://home1.netscape.com/comprod/products/navigator/version_3.0/multimedia/audio/how.html).

WEB PAGES THAT MEOW

Now that you know how to trigger a sound with LiveConnect, we can easily weave this action into an interactive Web page. This month's example was born as

the net prophets



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Director, Science Office
Sun Microsystems Computer Corp.
Keynote Speaker:
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an homage to a feline named Pippar, as seen in Screen 1 (previous page).

What may look like a static cat page in print is, in fact, a meowing, purring, screeching page in practice (at least in Netscape 3.0 or higher). To hear for yourself, point your browser to *Internet World*'s Web site (http://www.iw.com) to download the whole script.

EXAMPLE 2: LIVEAUDIO METHODS

play()—Plays a specified LiveAudio sound.
stop()—Stops playing a specified LiveAudio sound.
pause()—Pauses a specified LiveAudio sound. Triggering **play()** will continue playback.
IsPlaying()—Returns **true** if a specified LiveAudio sound is currently playing.
GetVolume()—Returns the current volume level (as a percentage of 100) of the specified LiveAudio sound.

The Pippar page contains four types of audio feedback:

- When the user passes the cursor over one of the links ("Her loves," "Her loathes," etc.), a tone sounds; I used a telephone touch tone, but you can pick one that suits your taste. In your own pages, you could easily combine this technique with image replacement (see Tricks with Scripts, Sept. *IW*) to create, for instance, highlighted menus whose change in appearance is augmented by an audio cue. Alternatively, you could use this technique to assign sounds to particular hyperlinks to aid visually impaired visitors.
- When the user clicks one of the hyperlinks, a "whoosh" sound is played.
- When the user clicks the "Hello, she said" button, a sound file of Pippar's welcoming meow is played.
- When the user passes the mouse over the image of Pippar's lounging bulk, one of four possible cat sounds—various meows and screeches that I've named pip1, pip2, pip3, and pip4—are played at random.

In creating this page, we first must embed all of the sounds. This page contains a total of seven sound files, so we must include seven <EMBED> tags, using the model in Example 1. It's probably simplest to place all of your <EMBED> tags just after the page's opening <BODY> tag, although they will also work if placed elsewhere.

When the browser loads this HTML file, it will initially play each of the sounds because we've set the autostart parameter to true (as shown in Example 1). However, the user won't hear them play because the initial volume has been set to zero. Why? This forces all of the sound files to download with the page. While this certainly increases initial load time, when the user triggers a sound it will play immediately, rather than having to download at that moment.

The heart of the page is our JavaScript function play(), which actually plays a sound on demand courtesy of LiveConnect and the LiveAudio plug-in. As shown in Example 3, however, this vital function is relatively small and simple. The play() function accepts one parameter, soundname. Remember that each embedded sound is assigned a name, such as pipspeak. When calling the play() function, we must specify, as a string value, the name of the sound to play—for example, play("pipspeak").

EXAMPLE 3: THE PLAY FUNCTION

```
function play(soundname)
{ playstr1="document."+soundname+".setvol(100)"
  playstr2="document."+soundname+".play(1)"
  eval(playstr1)
  eval(playstr2)
}
```

The first code line of play() constructs a string that represents the LiveConnect syntax for setting the sound's volume. Here, we set the volume to 100 percent. In the second code line, another string is constructed that contains the syntax to play the sound. Notice that we call the LiveAudio method play(1) and the value 1 causes the sound to play one time. If you specify play(5), the sound would play five times when triggered.

Now that the two LiveConnect syntaxes have been constructed, we execute them using JavaScript's built-in eval() function, which executes a string as JavaScript code. Thus, when we call play("pipspeak"), two statements will ultimately be executed: document.pipspeak.setvol(100) and document.pipspeak.play(1).

Within the Web page, we trigger the play() function using standard event-handling practices. For instance, the HTML for the "Hello, she said" button employs the onClick event handler:

```
<input type="button" value="&quot;
Hello,&quot; she said."
onClick="play('pipspeak')">
```

Each of the four hyperlinks in the white box employs onMouseOver and onClick event handlers to trigger the appropriate sounds:

```
<a href="javascript:void(0)"
onMouseOver="play('highlight')"
onClick="play('clicked');
return false">Her loves<a/>
```

When it comes to "petting the cat," we use another onMouseOver event handler tied to the image of Pippar. However, <IMG> tags do not support the onMouseOver event, so we have to be a little creative. In this case, we enclose the Pippar <IMG> tag within a hyperlink <A> tag that itself can contain an onMouseOver event:

```
<a href="javascript:void(0)"
onMouseOver="petpip()"><img
src="pippar1.gif" width="183"
height="134" border=0></a>
```

The flaw in this approach is that the onMouseOver event occurs when the mouse passes anywhere within the rectangle containing the image. Since Pippar is irregularly shaped, the event may trigger if the mouse hits a spot inside the rectangle but outside the image's parameters. To solve this precisely, we'd need to replace this script with an image map, where the coordinates outlining the image are exactly defined; this involves some rather complicated coding, however, though load time is about the same as the load time with a rectangle.

Also note that the onMouseOver event handler in this script calls the function petpip(). This JavaScript function simply selects a random sound from four

possibilities (pip1, pip2, pip3, and pip4) and then calls the play() function.

PROBLEMS TO AVOID

Adding interactive audio feedback to your Web pages is certainly easy, although it's not commonly seen on the Web—perhaps because the documentation for using LiveConnect with LiveAudio has been for the most part hidden within Netscape's developer documentation. However, there are some issues to take into consideration when breathing a voice into your pages:

- Though the LiveAudio plug-in has been included with the default Netscape Navigator installation since version 3.0, it's possible that a user has overridden his or her LiveAudio plug-in with some other plug-in that handles audio files. In that case, the LiveConnect methods shown in this article may not function properly—or at all.
- LiveAudio sometimes behaves poorly with audio files that are not in stereo. If you find that a particular file is playing erratically when you test your page, you might consider converting the file to a stereo file, easily done with audio-editing software such as Syntrillium's CoolEdit or Sonic Foundry's Sound Forge.
- Sound files can dramatically increase the time it takes to download your Web page, especially if you use a lot of them. Consider your audience: If your page is primarily used within a high-speed intranet, large sound files won't be a problem. Over the Internet, you may want to show some restraint by using audio-editing software to reduce audio-file size through resampling and compression.

VARIATIONS FOR IE

Yes, it is possible to re-create the Pippar page and this month's goal under Internet Explorer 3.0 or 4.0. However, Internet Explorer does not support LiveConnect and does not use the LiveAudio plug-in to handle audio files. Your best bet in creating audio feedback within IE is to use an ActiveX control in place of the LiveAudio plug-in.

For instance, the ActiveMovie control, which is included with IE, can play audio files. Rather than use the <EMBED> tag as in Example 1, you would use the <OBJECT> tag to include an ActiveMovie control for each sound file in your page, as seen in Example 4. Then, using JavaScript much like that in our play() function (Example 3), you would call methods of the ActiveMovie control rather than the LiveAudio methods.

For instance, the ActiveMovie method run() is analogous to LiveAudio's play(). An advantage of using ActiveX controls is that if you don't like the one you're trying to program with (say, ActiveMovie), you can find another control that plays sounds (additional controls are available at http://www.activex.com—enter the keyword wav and you'll see which ActiveX controls handle audio files). When visitors open your page, whichever control you decide to use will automatically download and install for them.

Adding sound effects can certainly make Web pages snap, crackle, and pop (not to mention meow), but their real value lies in making your site more user-friendly—and that will keep visitors coming back for more. ■

EXAMPLE 4: SOUND WITH EXPLORER

```
<object id="pipspeak" classid="CLSID:05589FA1-C356-11CE-BF01-
    00AA0055595A" align="baseline" border="0" width="14"
    height="14">
<param name="_ExtentX" value="106">
<param name="_ExtentY" value="106">
<param name="ShowDisplay" value="0">
<param name="ShowControls" value="0">
<param name="FileName" value="pipspeak.wav">
<param name="Volume" value="-593">
<param name="Balance" value="0">
</object>
```

Aaron Weiss, a contributing editor to Internet World, *is a freelance writer based in Canada.*

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Font Control

HTML typography is a challenge you can't ignore. **BY WAYNE BREMSER**

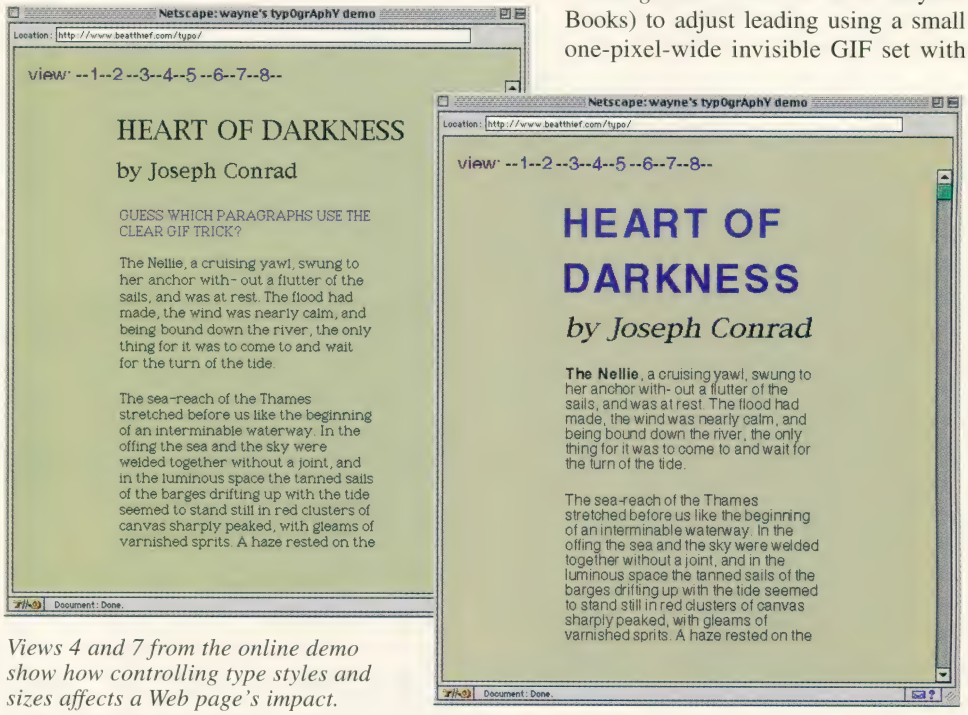
Typography is probably the area of Web design that most desperately needs improvement, in both technological advancement and designer implementation. People spend hours perfecting images with a Web-safe palette but then neglect a few simple <FONT> tags. Compared to print design, typography on the Web is in a state of complete anarchy. Using GIFs to render desired fonts has become very popular, despite the bandwidth this consumes. This month we'll look at how you can use HTML to quickly and easily improve your site's typography.

SIZE MATTERS

Control is an important issue for designers. In the June HTML Workshop I talked about using an HTML table to create nice margins in order to get control over the spacing on a page's layout (http://www.iw.com/1997/06/workshop.html). This month I created a demo that illustrates how typography adjustments affect one piece of text (http://www.beatthief.com/typo). The initial shot of the page (View 1 online) shows a large block of text and a headline in their most basic ASCII form. Click on View 2 to see how putting that text in a table improves the look of the page.

Along with spacing in text blocks, such as kerning (the space between letters) and leading (the distance between lines), there are considerations involved in font size. Creating a contrast with font sizes on your page is the best way to funnel attention to one element or another. This works similarly in print. (A great book that covers the subject is *Stop Stealing Sheep & Find Out How Type Works* from Hayden Books.)

With the SIZE attribute of the <FONT> tag (such as <FONT SIZE="+1">), HTML provides ways to control the size of every piece of type on your page. If you want your body type to be a certain size, use the <BASEFONT SIZE="3"> tag to set the default size. Use the SIZE attribute to increase the size of your headlines or subheads. The other—and possibly easier—way to alter text size for headlines and subheads is with heading tags (<H1>, <H2>, etc.). The online demo shows how different font sizes in Views 3 and 4 grab your attention in different ways.



Views 4 and 7 from the online demo show how controlling type styles and sizes affects a Web page's impact.

When you put words in tables that are small (let's say for a navigation bar), you will want to use the SIZE attribute to shrink the text. There are many possibilities, as you can go from SIZE="-7" to SIZE="+7" or use smaller head tags like <H5> and <H6>. Keep in mind that Internet Explorer users have control over font size from their button bar. Somebody who has trouble reading text on IE is going to click a few times to enlarge it. This may break your tables and ruin your design.

Unfortunately, there is far less control over leading and kerning. There is a trick (popularized by David Siegel in his book *Creating Killer Web Sites* from Hayden Books) to adjust leading using a small one-pixel-wide invisible GIF set with VSPACE at 6, 8, or 10, depending on how wide you want it to be. Creating the GIF in Photoshop and uploading it is a five-minute process. Your code might look like this:

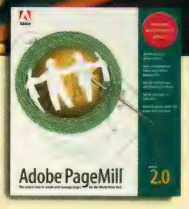
```
<IMG SRC="./images/clear.gif" VSPACE=7>

Now, this is your regular body text where
every few words <IMG SRC="./images/clear.
gif" VSPACE=7> you insert one of these use-
ful clear GIFs <IMG SRC="./images/clear.gif"
VSPACE=7> which fixes the leading.
```

It certainly works, but I think the results are not impressive enough to warrant the added hassle when creating a



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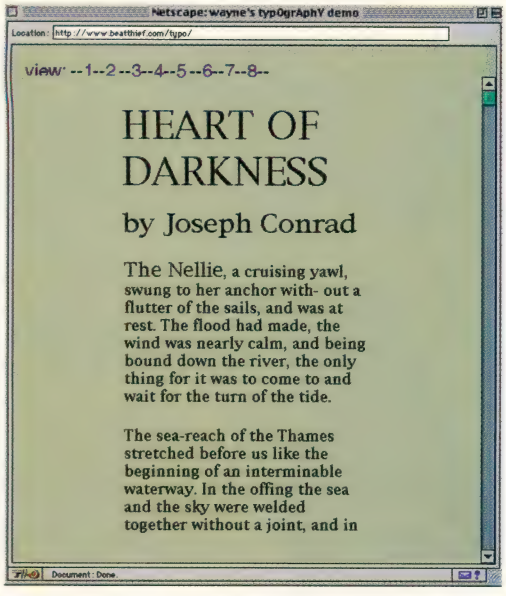
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page. An example of this is on the next page (and at http://www.beatthief.com/typo/clear.html).

FACE OFF

Web browsers allow users to set a default font for all HTML text on a page. For page designers, this means that the rest of the world is probably seeing their pages in Times Roman (to which most browsers default). The FACE attribute is a way around this.

Using the FACE attribute, you can specify any text font to be used—but don't specify some wacky font that viewers don't have. Common fonts (correlating Mac fonts are in parentheses) are: Arial (Helvetica), MS Serif (New York), MS Sans Serif (Geneva), Courier New (Courier), Symbol (Symbol), and WingDings (Zapf Dingbats).



Strategic use of invisible GIFs can help you tightly control the leading between lines, but it's a cumbersome process to insert them.

The nice feature about the FACE attribute is that you can specify several fonts in case the user doesn't possess the first choice. Thus, you can use the above list to cover both PC and Mac users. For example:

```
<FONT SIZE="+3" FACE="Arial,
Helvetica">this is big sans serif type</FONT>
```

Your main consideration with FACE is choosing between serif or sans serif styles. A serif font, such as Courier or Times, has the little hooks, or serifs, at the top and bottom of a "T" or "H." Sans serif letters are without those, including Arial and, obviously, MS Sans Serif and Geneva. Check out Views 4, 5, and 6 of my online demo to see how using different faces changes a page's look.

Another consideration with your fonts is style: Remember to use the bold (<B>), italic (<i>), and underline (<U>) options. Be careful when using italics in small sizes, as it can become extremely hard to read.

COLOR CONSIDERATIONS

Don't forget your control over typography color. You can specify the colors of text like this:

```
<BODY BGCOLOR="#FFFFFF"
TEXT="#000000 "LINK="#6600FF"
VLINK="#660000" ALINK="F33FFF">
```

The above tag specifies a white background, black text, a bluish link color, a dark red visited-link color (VLINK), and a neon blue active-link color (ALINK, the color of a link while you are clicking on it). You can also specify color in the <FONT> tag, even if the text is a link (which can be dangerous, as Web viewers are used to seeing links as a different color from body type). Web sites like ColorCenter make things easy and allow you to click on a color palette for each link type and receive back the correct code string to paste into your HTML page (http://www.hidaho.com/colorcenter/cc.html).

There is a list of commonly used colors that you can specify by name rather than hex number. So rather than using numbers that mean nothing to you, you can specify something like <FONT COLOR="DarkOrchid1">. (This is supported by both Explorer and Navigator 3.0 and higher.) Check out these links for a full list: Color Index at http://colors.infi.net/colorindex.html and RGB Values at http://internet.oit.edu/~hoffmanj/rgb.html. Finally, look at Views 7 and 8 on the demo to see how color can alter the appearance of your typography.

Many designers neglect to add these few simple tags to make a site's type look attractive. I hope that the above tips will get you started on the path toward more appealing typographic design. ■

Wayne Bremser is a writer and designer whose focus is the Web and digital media.

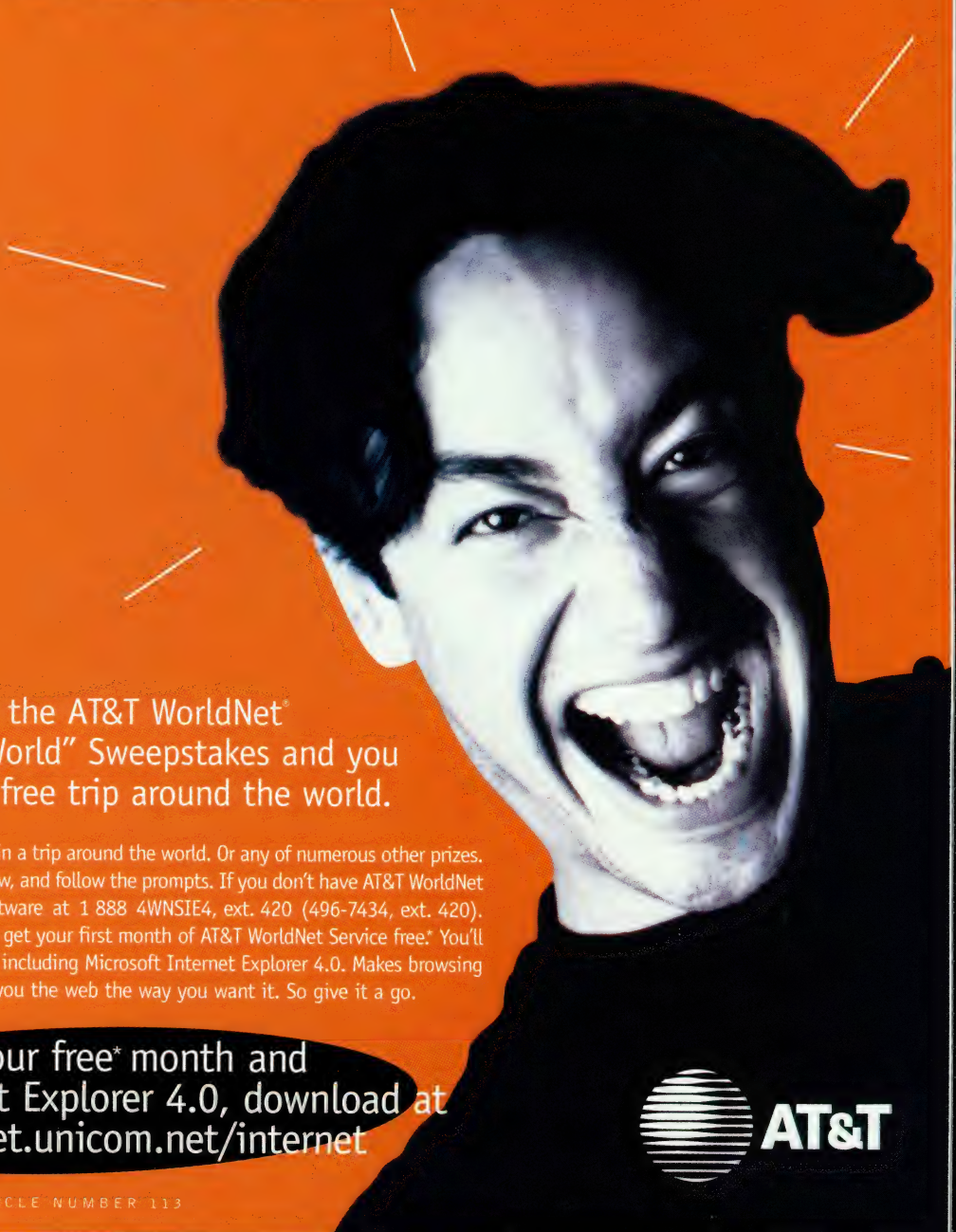
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Weekly Drawings: On-line entries must be received by 11:59 p.m. EST each Wednesday following the week in which you wish to be entered in order to be eligible for that week's drawing. For example, entries must be received by 11:59 p.m. EDT on Wednesday, May 7, 1997 to be eligible for the first week's drawing. On-line entries received by 11:59 p.m. EST on Wednesday, January 28, 1998 will be entered in the final weekly drawing, the final quarterly drawing and the Grand Prize drawing.
Quarterly Drawings: On-line entries must be received by 11:59 p.m. EDT on Wednesday, July 30, 1997 to be eligible for the first quarterly drawing. On-line entries must be received between 12:00 a.m. EDT on Thursday, July 31, 1997 and 11:59 p.m. EST on Wednesday, October 29, 1997 to be eligible for the second quarterly drawing. On-line entries must be received between 12:00 a.m. EST on Thursday, October 30, 1997 and 11:59 p.m. EST on Wednesday, January 28, 1998 to be eligible for the final quarterly drawing.
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Buttons and Beaux (Arts)

Small graphics touches to spice up your site. **BY DAVID D. BUSCH**

Even simple graphical elements—backgrounds, buttons, rules, and enhancements like drop shadows—can add piquant flavor to your Web pages without significantly increasing download time. A 10K background image or a 7K button or rule, for example, will transfer in a jiffy, even over a 14.4K connection; once downloaded, they're stored in the browser's cache for near-instant recall when they appear again on the same or subsequent pages on your site. Used thoughtfully and consistently, such graphical elements can create a unique style that serves as your Web-page trademark. Best of all, spicy effects like these are easy to create using the rich tools provided by your image editor.

BACKGROUND CHECK

Adding an interesting background to your page requires only a smattering of HTML code, (e.g., <BODY BACKGROUND="mygraphic.jpg">) and an image to work with. The art lies in making sure the image is as lightweight as possible and will tile seamlessly. Keeping these guidelines in mind, you can create an effective background from almost any image or texture by following the simple steps shown in Figure 1.

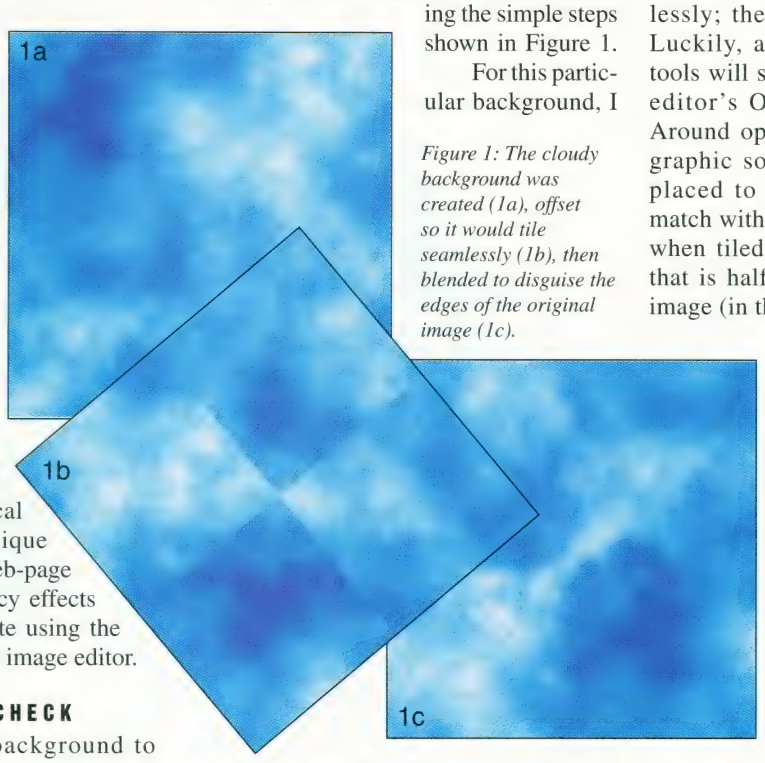


Figure 1: The cloudy background was created (1a), offset so it would tile seamlessly (1b), then blended to disguise the edges of the original image (1c).

For this particular background, I created a blank image much larger than you'd normally want for a background—600x600 pixels. The extra size was required because the filter I chose to use as the background texture doesn't provide enough detail when applied to smaller images. We'll shrink it down later.

Using blue for the foreground and white for the background, I applied Adobe Photoshop 4's Cloud filter to produce fluffy cumulus puffs reminiscent of the Windows 95 logo (Figure 1a). (You can use any texture your image editor provides, or work with a photo or other graphic. If you decide to base your background on a nonrandom pattern, start with the main subject matter in the center of the graphics space.)

As is, this graphic won't tile seamlessly; the edges show up too clearly. Luckily, a couple of standard editing tools will solve the problem. Your image editor's Offset filter (with the Wrap Around option checked) rearranges the graphic so that the center is now displaced to the edges, where they will match with the edges of duplicate images when tiled. The key is to use an offset that is half the width and height of the image (in this case, 300 pixels).

In Figure 1b, the old edges, now offset to the center of the image, show up distinctly. Using your editor's Clone or Rubber Stamp tool, hide the join lines by copying texture from elsewhere in the image over them, as shown in Figure 1c. Avoid working the (new) outer edges of the offset graphic; they should be left alone so they will merge invisibly.

That's all the magic. Finish by reducing the background to 25 percent of its original size (150x150 pixels) and saving it in JPEG format.

SHADOW PLAY

The logo shown in Figure 2 (below, left), while dramatic, was easily created using not one but two different drop shadows—together with the original text. The component elements of this logo are shown in the inset box.

Here's how they are created and layered together: Create your basic text logo (I used a black fill for the text), then copy and paste it into a new layer. Use a blurring tool (like Gaussian Blur) to fuzz the text slightly. (If you're using Photoshop, don't check Preserve Transparency or

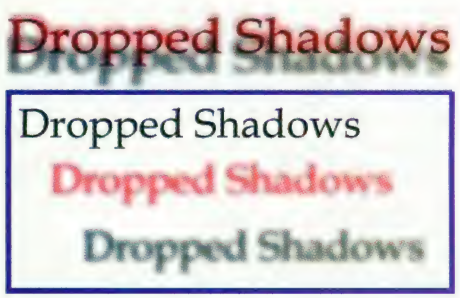
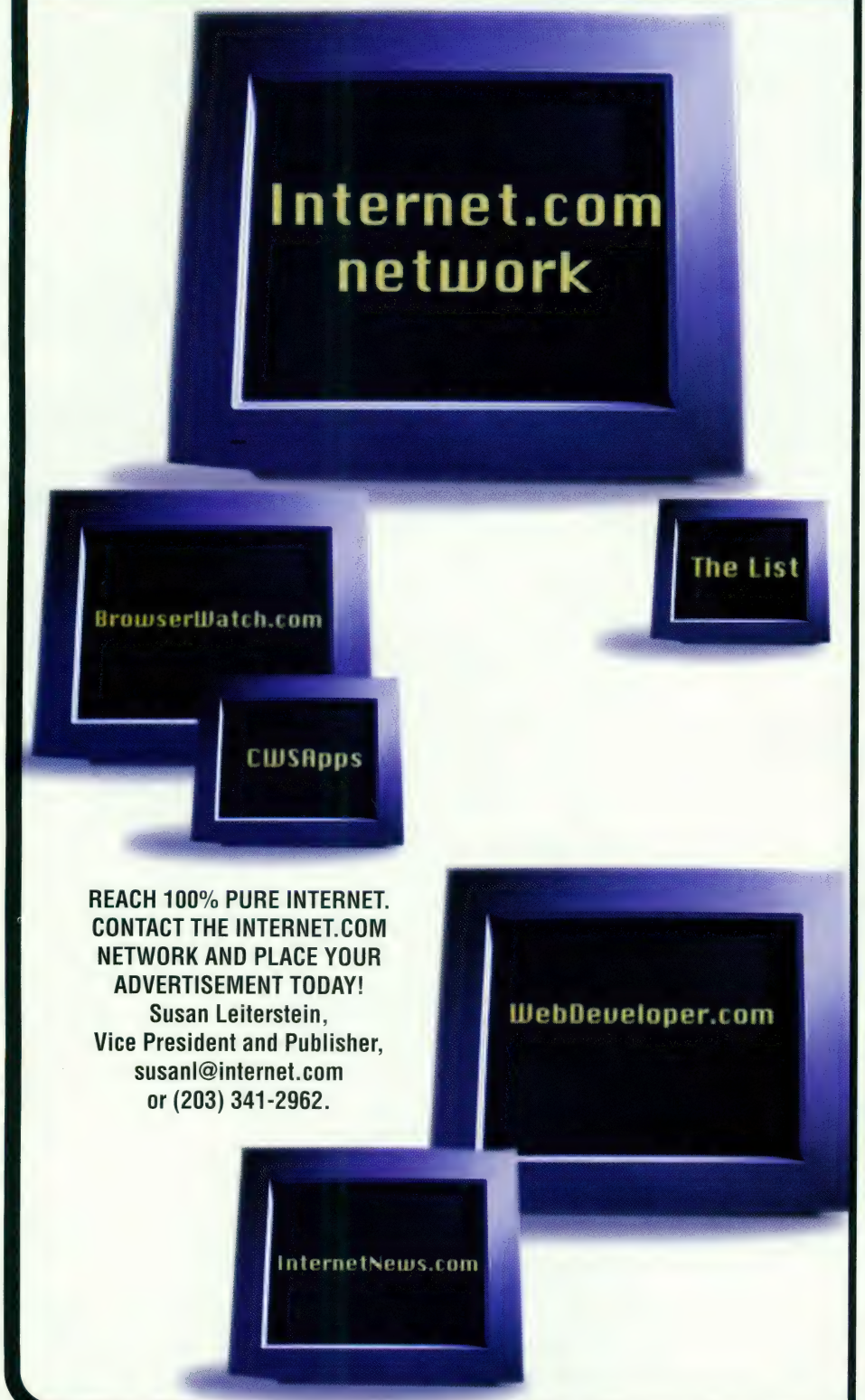


Figure 2: Blurry drop shadows can make text or other objects appear to float above your page.

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the blur won't "spread.") Then produce a second, even blurrier, version using another copy of the text pasted down on a second layer. Fill the two blurred layers with contrasting colors (we used red for the first, black for the second). But this time, *do* check Preserve Transparency, so that only the blur will be filled with color.

Finish by positioning the first of the blurred layers right on top of the original text (giving it a red glow) and the second behind and slightly below it, to produce the interesting drop-shadow effect. Some tips:

- This technique is best applied to JPEG files, as the fine gradation of tones looks best when presented with more than the 256 colors (max) you get with GIFs.
- Make the background of the image containing the drop shadows the same color as your page's background so the text will appear to float above the page.
- You can also create hard-edged shadows by omitting the blur step for a different effect.

HOT BUTTONS

Nothing says "custom Web design" more than unusual, distinctive buttons. (The stuff that comes from clip-art libraries is pretty easy to spot.) If you can work in your logo or provide some other personalized touch, your statement will be that much stronger. Fortunately, this doesn't necessarily require a lot of effort; the examples in Figure 3 are surprisingly easy to create.



Figure 3: Buttons can easily take on a three-dimensional look and/or be based on interesting irregular shapes.

The simple but distinctive button at left is a circular selection filled with a two-color radial gradient, then texturized. Your image editor has a variety of filters that will let you add glass beads, sandstone, burlap, or other textures to the image. To make the button look three-dimensional, use your Spherize (or equivalent) filter. (This was done with the Glass Lens filter from Kai's PowerTools 3.0.)

The rectangular button to the right is another example of a two-color gradient used to create a 3-D effect. The trick is that the gradient is applied to both the center and the edges—but in opposite directions.

First select the colors for the linear gradient. (A light and dark version of the same hue works best, as this enhances the 3-D effect.) Create a square or rectangular selection, then fill it with the gradient, starting at the upper-left corner with the light color and continuing down to the lower-right corner with the dark color. Then reduce the size of your selection so it encompasses only the center of the button. (With Photoshop, you can do this by using the Select | Modify | Contract menu choices and typing in a pixel value of 5 percent or 10 percent of the width of your button.)

Fill the center of the button with the same gradient, but progress from the lower right to upper left, so the button will be darker in the upper corner and lighter in the lower. This produces the 3-D effect. Add appropriate button text and you're done. Use one of the drop shadow techniques described above on the button itself, or its text, to further enhance the three-dimensional effect.

Here are some variations that will give you even cooler effects:

- Use blurry selections to make your 3-D button look softer.
- To create a multilevel button, simply repeat the alternate gradients.

To give buttons a harder look, divide the outer edges into four trapezoids (draw a solid line from the inner corner to the outer corner of the edge), then fill each with its own gradient.

You can mix colors for a more interesting look.

The free-form example at the bottom of Figure 3 is a quickie that shows how you can create irregularly shaped buttons using the transparent GIF tricks we showed you a few months ago. I created a rough outline using the Lasso selection tool, then smoothed it, and added texture and some text. That's all there is to it.

RULES OF DISTINCTION

Figure 4 shows how you can quickly make interesting, even arresting, rules out of just about any graphic or random artwork.

I began with a simple oblong swatch of color and sketched on it using a variety of colors, as you can see at the top of the figure. Select one of your image editor's brush-stroke filters to add a painterly effect, as shown in the center. Then squeeze the height of the rectangle and stretch it out lengthwise to produce a ruling line.

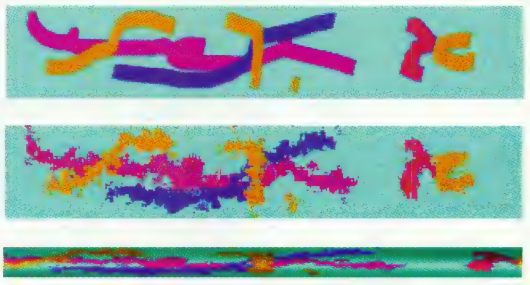


Figure 4: Any image or photo can be transformed into a 3-D rule using filters and simple brush techniques.

I also applied the burn/darken tool (to the upper and lower edges) and the dodge/lighten brush (to the center) to create a more tubular effect. (See "Now You See It," Graphics Toolbox, Nov. *IW* for a more detailed description of this 3-D enhancement.)

When using graphics as rules:

- You should make them no wider than the smallest browser window your visitors are likely to use—400 pixels, or even smaller, is a good idea.
- Center the rule on your page so it will nestle in the middle at almost any window size.

Buttons can be stretched in the horizontal dimension to produce abstract rules that are automatically color coordinated with the buttons on your page. ■

David D. Busch is a contributing editor to Internet World *and the author of 55 books on imaging subjects.*

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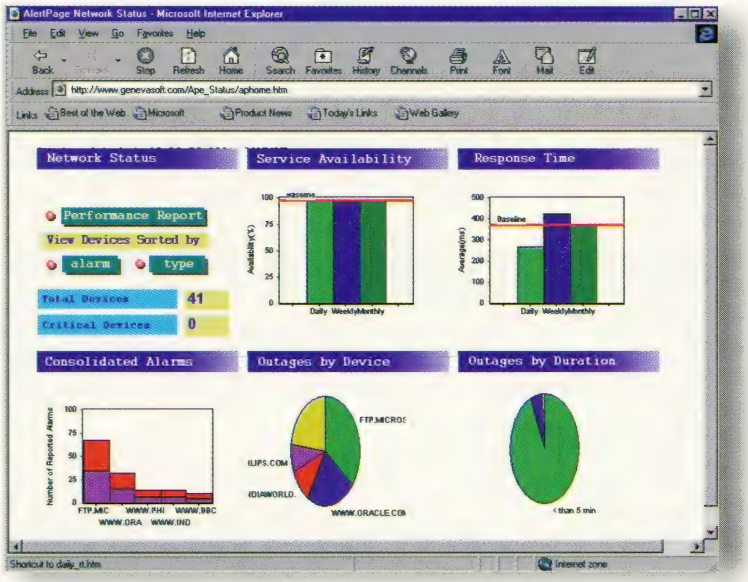
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Web-Site Watchdogs

Monitoring tools pinpoint problems. **BY KEVIN REICHARD**

You can die a death of a thousand pinpricks if your company is running a busy Web site and you experience performance problems with your Internet server. Your internal users may not be very patient if they need to wait an extra few seconds—or longer—for that Web page or file to be transferred to their system. No one will be happy when your mail server mysteriously goes down. And those connecting to your Web site surely won't be happy when they're denied access because the server is busy.



AlertPage Enterprise is a robust tool for high-traffic Web sites; it monitors both the server itself and connected hardware such as routers.

Short of investing tens of thousands of dollars in hardware, one thing you can do to minimize problems with your Internet server is to invest in a site-monitoring tool. There are many of these software packages on the market, and they generally perform three functions: analyze the content on your Web site to make sure that users aren't running into dead ends (e.g., broken links); examine who is logging on your Web site and report exactly what they're doing in terms of viewing and downloading specific files; and monitor your network's performance to make sure that Net data is being transmitted as quickly and reliably as possible.

These tools run on Windows NT and work with Microsoft Internet Information Server (IIS) or other Internet servers to improve performance. Some Unix-based Web servers, such as those running on Hewlett-Packard or IBM Unix workstations, have their own proprietary tools for monitoring and enhancing network and server performance.

WHO'S USING THE SERVER?

The first step in analyzing Web-server performance is to find out exactly who is using your Web server and why. Eyescope from Flicks Software presents a complete view of server activity, including which users are currently logged on, the referring links that brought users to your site, which browsers they are running, which files were requested and were subsequently reported as missing, files being downloaded by users, the most popular pages, the most popular first pages (in other words, pages other than your home page to which users initially connect), the most popular last pages, and statistical graphics covering usage levels.

This software has been optimized for the Microsoft environment: It uses ActiveX controls to gather and display information from the server, and you must use Internet Explorer (for running the ActiveX controls, of course) to view the information. You can download a trial version from http://www.eyescope.com; you can also buy a full copy for $99.

A similar but more extensive tool for monitoring your site is Web Analyzer from InContext Systems (http://www.incontext.com).

Common Server Problems...

... And how monitoring tools fix them.

- The server goes down, but no one tells the server manager. AlertPage Enterprise notifies you of any server malfunction.
- A bad hardware connection slows down performance. AlertPage looks at hardware connections and warns you when a piece of hardware, such as a router, has gone on the fritz.
- The network isn't set up to send out data efficiently—Net.Medic can analyze such bottlenecks.
- Links don't lead anywhere—users hate that! Eyescope and Web Analyzer examine your site for bad links or missing files.
- The Internet is overwhelmed with users—not much you can do about that.

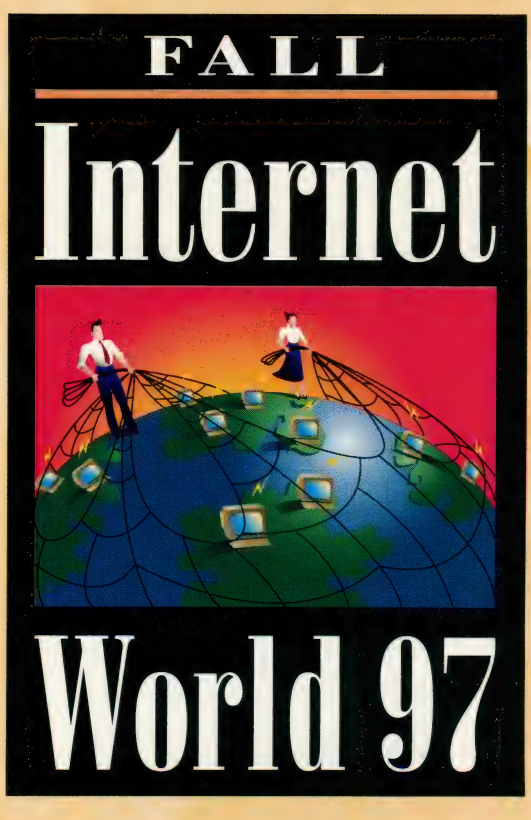
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Web Analyzer focuses on broken links (including mailto:, gopher, and FTP links) and usage statistics. The most notable and useful feature in Web Analyzer is its ability to view your site layout in five interactive views: Wavefront, File, URL Tree, Site Map, and Link. For instance, the Wavefront view arranges your site layout in a graphical manner, while the Link view uses an outline to show where your site goes. You can also set up custom reports covering every aspect of your Web server. Web Analyzer actually runs on a client workstation (running Windows 95, NT, or 3.1); you access the server remotely via the Web Analyzer application and a Web browser (Netscape Navigator or Internet Explorer). You can order a copy of Web Analyzer online for $249.

Though Eyescope and Web Analyzer return useful information and eliminate the need to wade through logfiles, these products don't perform in-depth network or connection diagnostics. A good tool for diagnosing network performance on user workstations is Net.Medic from VitalSigns (http://www.vitalsigns.com).

Net.Medic is a real-time performance monitor that specifies where problems on an Internet connection take place: your PC (for instance, Net.Medic reports when your CPU is the bottleneck), modem, Internet service provider, Internet backbone, or remote Web-site server. While there's no direct analysis of your Web site, you can use Net.Medic to locate problems, and the knowledge that your Web site is a bottleneck in the larger scheme of things is, of course, useful information. You can also use Net.Medic to improve performance for your users; the program can diagnose and fix problems with modems, Winsock connections, and network hookups. Netscape is also including Net.Medic SE as part of the Netscape Communicator Deluxe Edition, sold through retail stores. The list price for Net.Medic is $49.95, but there are multiple-user and corporate discounts.



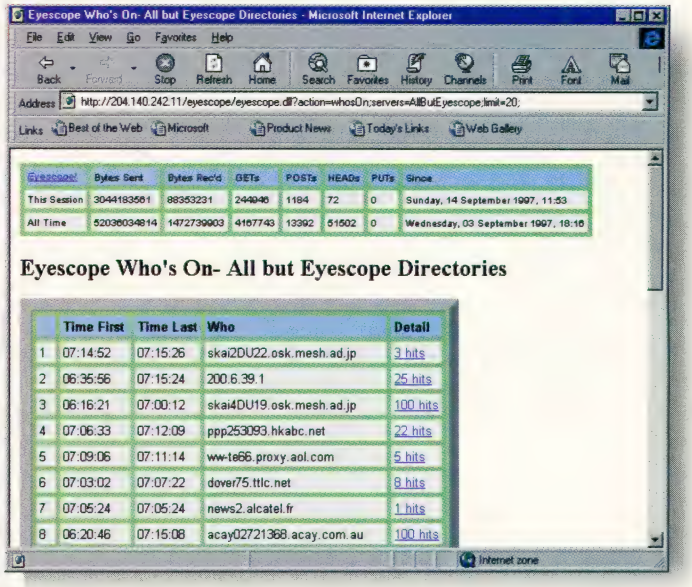
Net.Medic knows when a user's PC or ISP connection is under the weather.

HEAVY-DUTY SOLUTION

A more robust—and expensive—tool for monitoring your Internet site from the hardware side is AlertPage Enterprise from Geneva Software (http://www.genevasoft.com). AlertPage Enterprise is billed as "mission-critical" software, and it's designed for server managers whose Web sites and networks must be up and running 24 hours a day. AlertPage Enterprise monitors both the physical server and the connected devices, including routers. Technically, it's not a tool just for Web servers—it's designed for any Windows NT or NetWare server—but it's a logical choice for a high-traffic corporate Internet site.

When you install the AlertPage Enterprise software, you begin by analyzing the network and attached devices and setting the thresholds for downtime for each device. If you set the thresholds too low, you run the risk of setting off too many false alarms. As AlertPage monitors performance, it also summarizes minimum, maximum, and average response times for specific devices—it's ideal for detecting bottlenecks.

AlertPage Enterprise works simply yet effectively. It logs onto monitored servers and checks the Security, Application, and System logs on Windows NT; it can also be programmed to accept text from other logfiles. When a problem arises with your server, you can set up AlertPage Enterprise to send you e-mail or a message to an alphanumeric pager that supports the TAP (Telocator Alphanumeric Protocol) specification.



Who's on first on your Web site? Eyescope shows current users and the links that got them there; the software works best under IE/ActiveX.

The main fault with AlertPage is that you can't actually set it up to do anything once an error has been detected, except for informing you—it will not run an executable program in response to a specific problem, unlike other proprietary server tools in the NetWare world.

Because AlertPage Enterprise doesn't analyze individual connections between users and the server, or monitor Web-page downloads, it works best in conjunction with one of the other tools outlined in this column. The price is a bit steep ($695 for a five-device license to $5,500 for an unlimited-device license), but not excessive considering the high level of protection this product offers your Web server.

There are many other site-monitoring tools for Internet servers (check out the *Internet World* Web site at http://serverwatch.internet.com/tools/monitor.html for a complete list). Whichever site-monitoring tool you select, you'll find it's easier to get the information you need to keep your Web site running smoothly and efficiently. ■

Kevin Reichard has authored 24 books for MIS:Press, including The Windows NT 4.0 Internet Server *and* The Linux Internet Server.



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The 56K Question

Confused about 56K? You've got company. **BY TED STEVENSON**

The promise of extra speed that 56-Kbps modems hold out is tempting, but many early adopters are wondering if the technology is real. A recent letter from *Internet World* reader Bill Sutey got right to the point: "We recently bought and installed a K56flex modem. Not long afterward, a neighbor sent me some shareware called ComSpeed that tracks modem throughput. It indicated that my download speed sometimes peaked as high as 38K, but was generally lower. Our ISP said it's the phone lines and offered no other relief; the modem manufacturer has never replied to our queries. It wasn't clear to us when we purchased the 56K unit that results would vary. We're feeling pretty burned."

What's going on here? Are modem manufacturers selling us a bill of goods? Are ISPs failing to deliver the bandwidth we pay for? Is it really the phone lines? What should we realistically expect from this Internet access technology?

It's possible that an ISP could throttle down connection speeds on 56K accounts, but the likelihood is close to zero. Alan Taetle, executive VP at MindSpring, says, "We'd love for our customers to get 56K. The incremental bandwidth cost is almost negligible."

Much as we'd like a simple answer, the reasons for subpar 56K speed are complex and not easy to pinpoint.

The fact is that 56K line speeds are only a theoretical possibility—with either x2 or K56flex modems. For starters, FCC regulations currently limit modem communications to a top speed of 53K, but even that's more an ideal to aim for than a speed to expect. "At MindSpring, we don't even call it 56K," Taetle says. "That's really a misnomer. We simply call our high-speed dial-up service 'x2.'"

Setting aside the network and server traffic conditions that take their toll on all connections, some problems can be traced to your modem or computer system (an inappropriate initialization string, a computer without a fast [16550] UART chip, and the like). Much more likely, however, is one of the pitfalls lurking in your telephone service, or the interface between telco and Internet.

A 56K modem is essentially a V.34 unit with a digital supercharger that kicks in when ideal conditions exist in the connecting circuits. Today's switched telephone network is a hybrid system; some parts carry analog signals, others carry digital signals. Converters transform the signals back and forth as required; this is one major source of degradation.

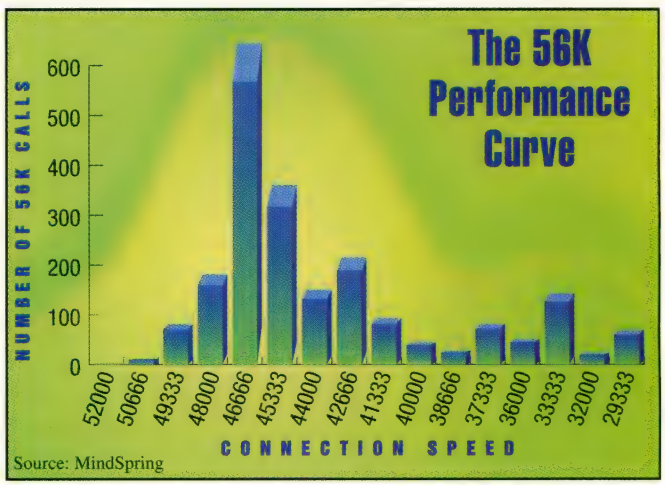
Expert opinion seems divided on whether both digital-to-analog conversions (DACs) and analog-to-digital conversions (ADCs) significantly degrade high-speed connections, but there's little doubt that crossing the digital/analog boundary multiple times leads to diminished performance. With more than one ADC in the loop, the modem simply drops back to V.34 mode. (Which is why you'll never get better than V.34 speeds upstream, since ADCs are unavoidable on the connection from your home or office back to the network.) And even when your connection passes only one ADC, the physical condition of the "local loop" (the copper wiring that connects your house's phone wiring to the phone network) can slow you down. You can't do anything about that (other than complain), but you may be able to fix some problems inside the building: The cable that connects your modem to the phone jack, as well as the number of devices plugged into that wiring, can hinder performance.

So what speeds can you reasonably expect from 56K Internet service? MindSpring took a look at its first few months with x2 access to offer some ballpark figures. Based on 1,900 calls made to its x2 modem banks during beta testing, MindSpring found that more than 75 percent of calls connected at speeds between 40K and 48K. A mere handful of connections achieved higher speeds, but more than 20 percent were slower than 40K.

THE ACID TEST

It is possible to test if the lines in your home or office can support x2 before you buy a new modem. A Test Line utility is offered by U.S. Robotics/3Com. Use your terminal emulation (communication) software to dial (888) 877-9248. You'll be guided through a series of diagnostics. Visit http://x2.usr.com/connectnow/linetest.html for more details.

And if you already own an x2 modem and you're curious about the line-speed software Sutey was using, you can download it from http://ourworld.compuserve.com/homepages/cordes/comspe_e.html. ■



Ted Stevenson is a senior editor at Internet World.

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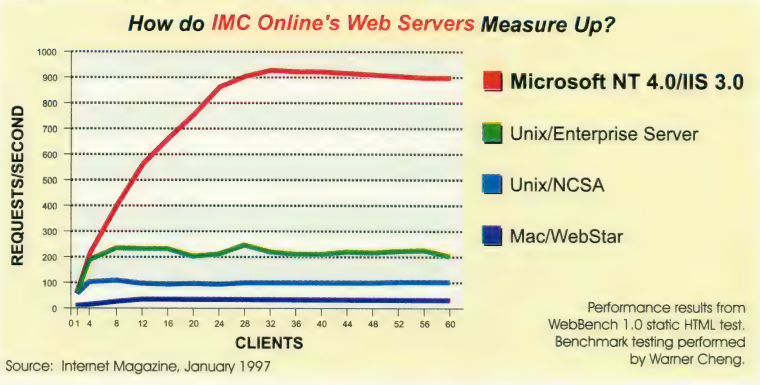
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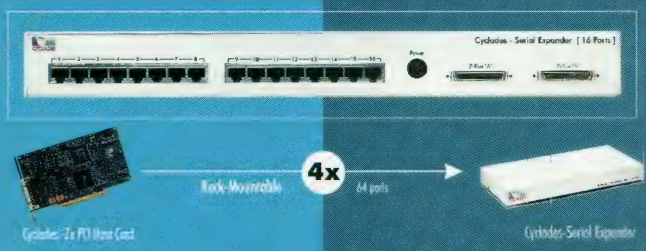
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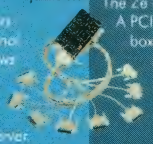


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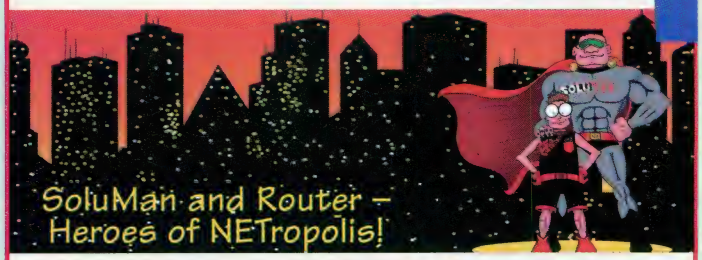


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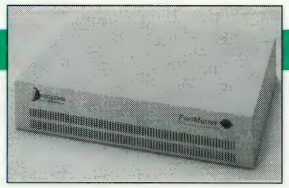
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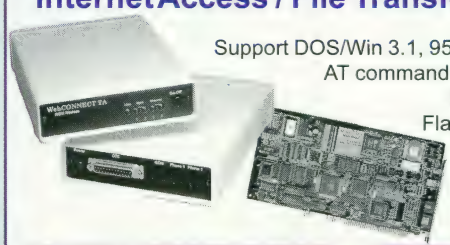
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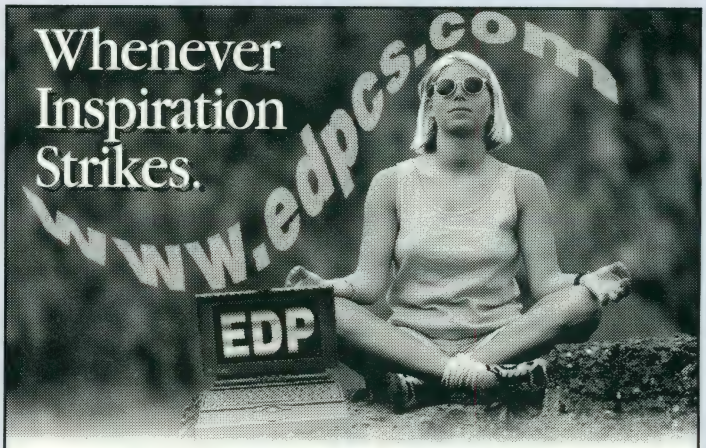


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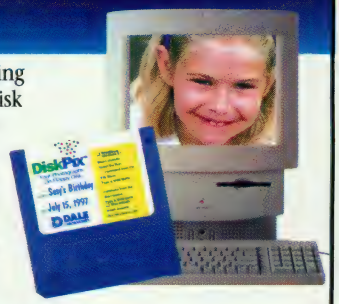
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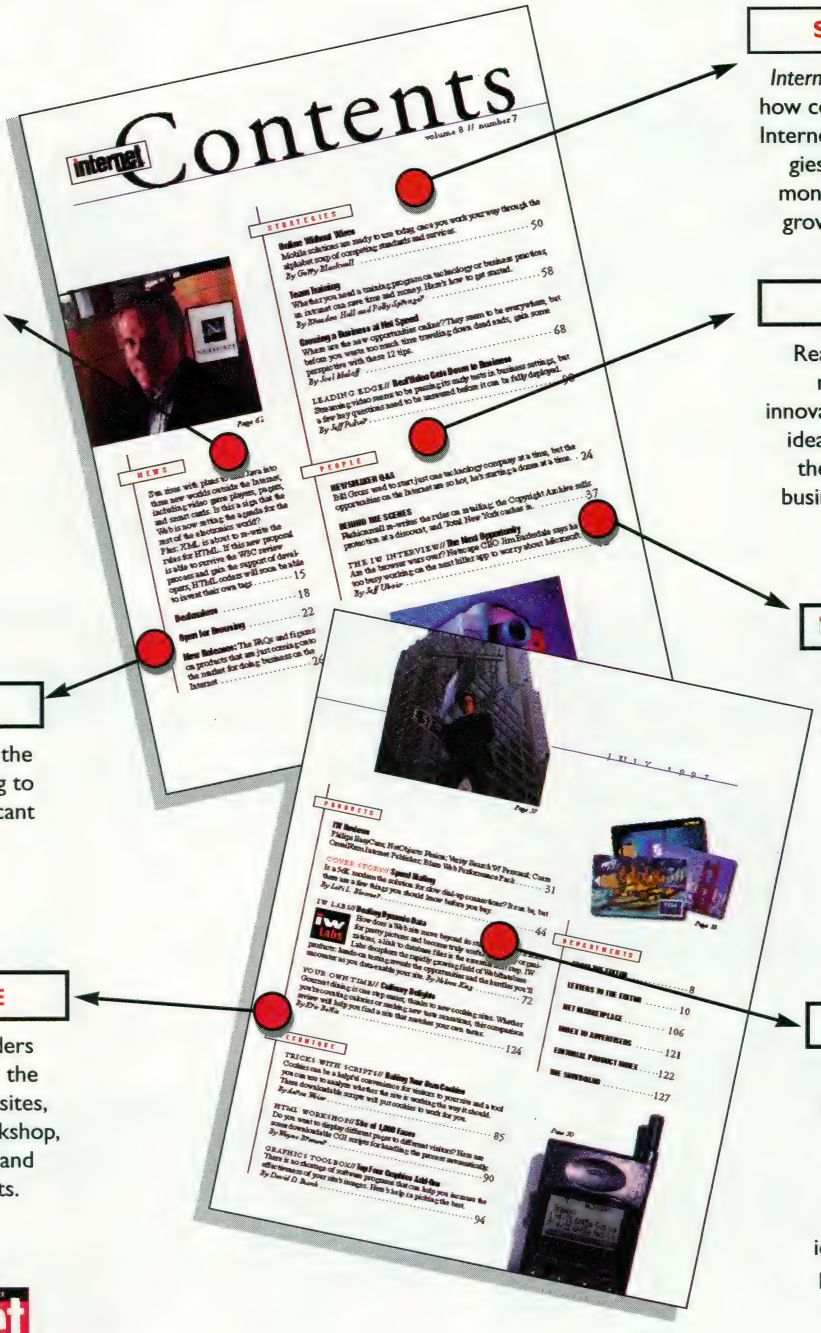
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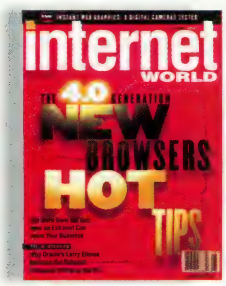
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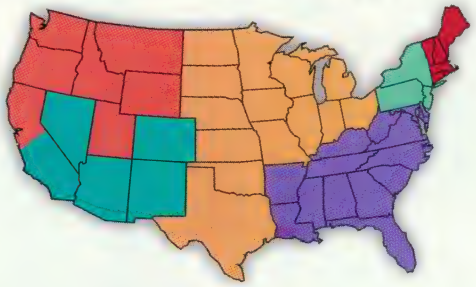
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In the Zone

By Eric Berlin

Whether you love 'em or hate 'em, any battle is more interesting when Microsoft is involved. Based on the assumption that interactive gaming on the Net is going to grow like gang-busters, Microsoft has decided to become a major player, competing with the established leaders, Mplayer and the Total Entertainment Network (TEN). • In arming for the coming confrontation, the powers of online gaming have been busy adding all kinds of new games to their respective arsenals. Mplayer (http://www.mplayer.com) is adding 15 new games from a dozen developers. TEN (http://www.ten.net) is adding a similar number. • Since we already profiled those two (May *IW*), this time we're concentrating on the offerings found at Microsoft's Internet Gaming Zone (http://www.zone.com). While the Gaming Zone has not added games at the same breakneck pace as its rivals, it nonetheless is quite busy making deals with the likes of LucasArts and Hasbro. The site is also changing its identity. It used to have a peaceful, parklike look, but with new additions like Outlaws and X-Wing vs. Tie Fighter, the Zone appears ready to compete. • Mplayer has its red "gizmo" interface, giving it a cool, ultra-high-tech image. TEN, with its oozy green colors, hints that grown-ups will be only tolerated at best. And the games on both these servers are heavy on gore. • The Internet Gaming Zone also seems ready to compete on another front: It does not run Netscape browsers. Apparently, this battle is operating on more than one level.

Eric Berlin is a contributing editor to Internet World.



QUIET CLASSICS

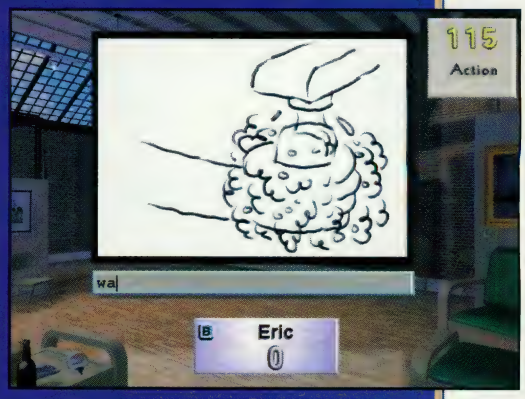
It's nice to have a place to play the classics, from board games like backgammon, checkers, and chess to card games like spades, hearts, and bridge. Granted, none of these games are taken as seriously here as they are at dedicated sites, but this is a fine place to swing by for a quick game. For one thing, finding a game takes about five seconds. Here's how it works: Just sit down at one of the many tables in each room and click a button. Any empty chairs at your table will become occupied by players—either computer (represented by computeroid animations) or human (represented by little peoploids)—and the game is on. You can also join a game in progress by clicking to cut in on a computer player at someone else's table. These basic games use plain, serviceable graphics.



OUTLAWS *LucasArts*

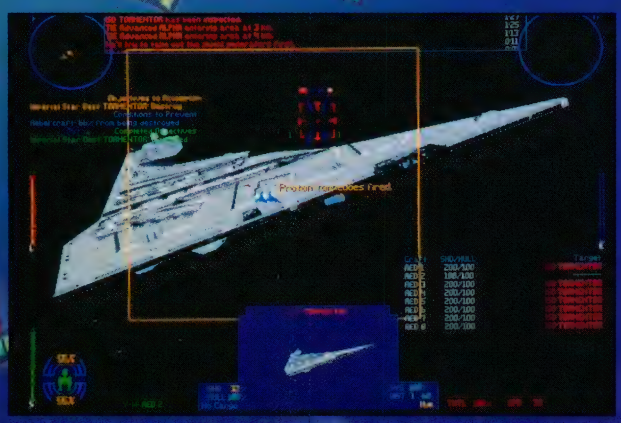
What a natural pairing: 3-D, first-person action-game technology mated with a Wild West scenario. The basic game of Outlaws has you hunting down the varmints who kidnapped your daughter—and you'll track them through every Western cliché in the book, from the abandoned mine to the ghost town to the speeding locomotive. Playing against the computer is plenty of fun, but for added thrills you can also join up with a bunch of human opponents via the Zone, and from there it's kill or be killed. Tip: Keep an eye on your ammunition supply; you don't want to burst in somewhere, guns supposedly a-blazing, only to find out you've forgotten to reload. If that happens, you'll have to find a hiding place—maybe duck behind the corner of a building, maybe even use your horse for protection—until you've got bullets in all chambers. Then come out shooting. You can play with teams; I prefer the rousing free for all.





PICTIONARY *Hasbro Interactive*

It's hard to imagine a game less in need of computerization than Pictionary, the classic party game of scribbled charades. It is nice to be able to get a game going whenever you feel like it, but computer-based Pictionary doesn't translate everything well from the pencil-and-paper version. The most damaging weakness is the drawing interface, which doesn't allow for much of the necessary subtlety (and thus, creativity) one can achieve with the classic tools. The good news is that Pictionary is merely the weakest of a fine assortment of updated commercial classics, including Monopoly, Risk, Scrabble (all of which are also available on Mplayer) and, soon, a Zone-only version of Boggle. If you want games that specialize in bloodshed, you can have 'em, but it's nice to see that calmer, more intellectually challenging games will be available online as well.



X-WING VS. TIE FIGHTER *LucasArts*

You'd probably agree that much of the fun of computer games lies in fulfilling our fantasies—general fantasies, that is. X-Wing vs. Tie Fighter, however, realizes one quite specific fantasy: What child seeing *Star Wars* didn't want to be up there alongside Luke Skywalker and Han Solo doing battle with the evil empire? Well, now those kids, most of whom are pretty much grown up now, have the chance. X-Wing vs. Tie Fighter is exactly what it sounds like: a nonstop dogfight between the forces of good and evil, played out against the computer or, even better, human opponents found on the Gaming Zone. As a simulator, X-Wing vs. Tie Fighter isn't nearly as in-depth as such gems as Mplayer's 688(I) Hunter/Killer, but neither is it something you'll master in the first five seconds. Get a feel for the various weapons—the lasers and the ion cannons—before you take on human opponents. When you're good and ready, believe me, there will be evil forces for you to battle … or, if you prefer, to join.

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The Surfboard

by Eric Berlin



Tourists looking for deadly vacations will be thrilled with this site.

Hurry! Danger Ahead!

Got a vacation coming up? Where are you going to spend it? Someplace staid and candy-colored, like Disneyland?

Well, Robert Young Pelton, Coskun Aral, and Wink Dulles have a better idea, or at least a more interesting one: They're the authors of Fielding's DangerFinder, a site for people who do not consider their vacation complete unless they have lost *at least* one limb (http://www.fieldingtravel.com/dp). The site details dangerous travel destinations around the world, from Afghanistan ("Watching the Katyushas make shallow arcs over Kabul used to be the only form of entertainment in this blown-to-hell town") to Uganda ("Driving to Gulu is discouraged; there have been numerous incidents. Hitching is even less advisable, but you may end up hitching if you decide to drive").

As much a history textbook as a travel guide, the DangerFinder goes into fascinating detail as to why so many places are so screwed up, as well as listing what immunizations you'll need to even get near, say, Burundi. Just choose a country, read "the scoop" about the country, the important "players," and the visitors' firsthand reports of their adrenaline-pumping stay there.

If you decide to venture into dangerous waters, a message board called Fielding's Black Flag Adventure Forum can keep you in touch with the Net's other die-hard (perhaps literally) adventurers. You can also order a copy of *Fielding's World's Most Dangerous Places* at the site.

If you don't have the dough for a dangerous vacation, perhaps you can find a dangerous job; the DangerFinder has a list of those, too, including bounty hunter, U.N. peacekeeper, and . . . New York City cab driver.

He Never Got Past the Driveway

As the host of a public-access cable show, *Driveways of the Rich & Famous*, John Cunningham has a hearty appetite for celebrity driveways. At the show's Web site, you can inspect more than 100 of them (http://www.driveways.com).



Wow, I stepped in Liberace's motor oil; I'll never wash my feet again!

Better yet are the transcripts of driveway-related interviews with the stars' gardeners and trick-or-treating details at celeb houses (Liz Taylor gives out candy bags printed with dollar bills).

When prompting the stars themselves to chat about their driveways, Cunningham has mixed success: Lloyd Bridges is happy to discuss the matter in detail but David Hasselhoff's vivid response cannot be printed here.

Vegetable Matters

You like rhubarb? The authors of The Rhubarb Compendium (http://www.clark.net/pub/dan/rhubarb) have detailed the history of the rhubarb from its origins (in 2700 B.C.) to the vegetable's importation to America (via a Maine gardener who, alas, is not named "Johnny Rhubarb") The Rhubarb Compendium offers growing tips (in winter, one must "force" the rhubarb from the soil) and hundreds of rhubarb recipes, from jams to wines to cakes to soups. If some persistent 'barbs remain underfoot, you can graduate to alternative uses: dishwashing detergent, hair coloring, and insecticide (might want to keep that in mind when cooking up those recipes).



Michael Sloan

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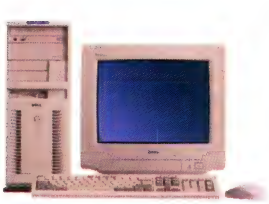


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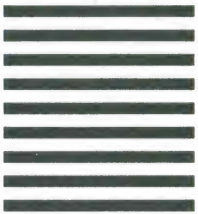
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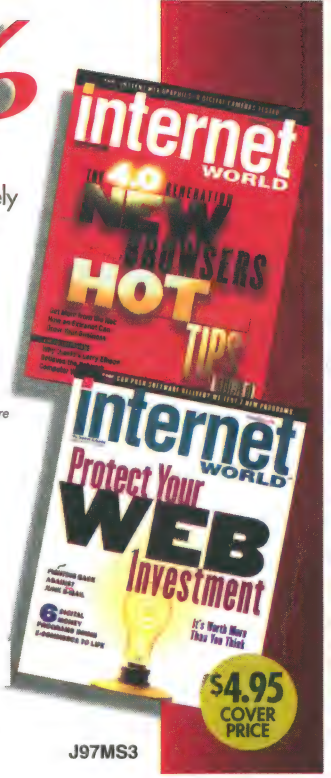
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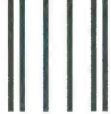
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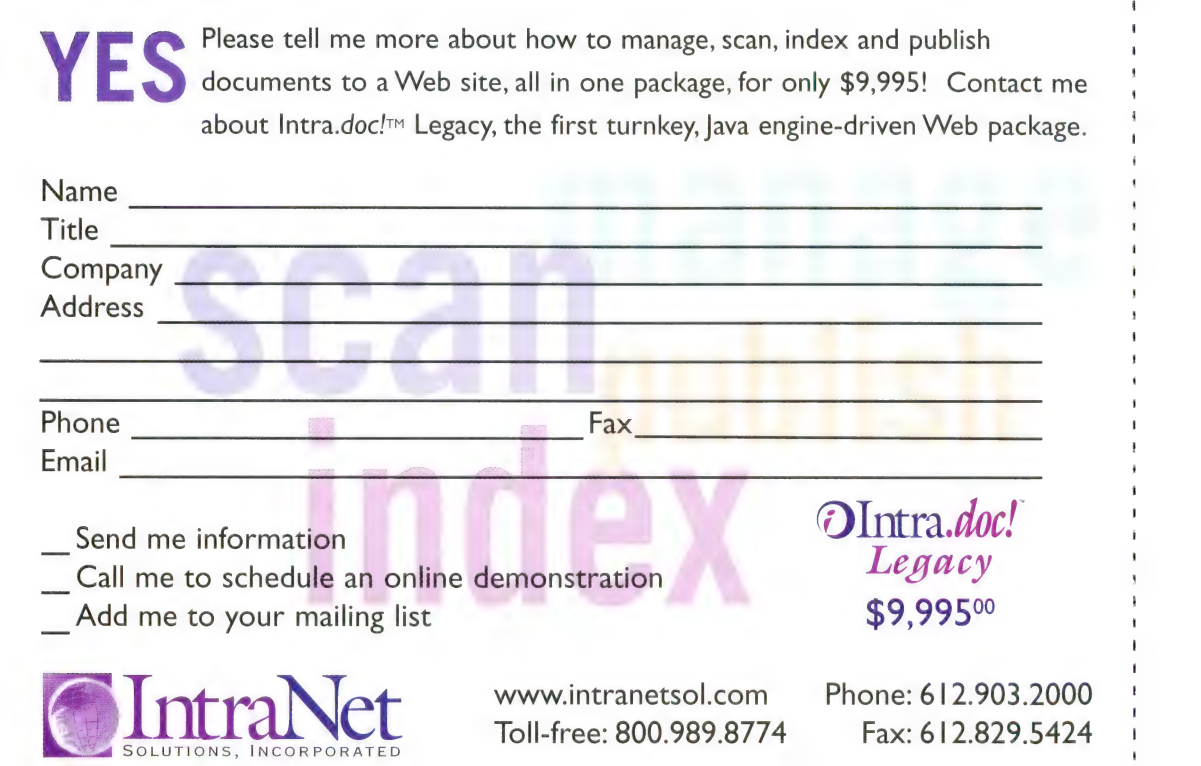
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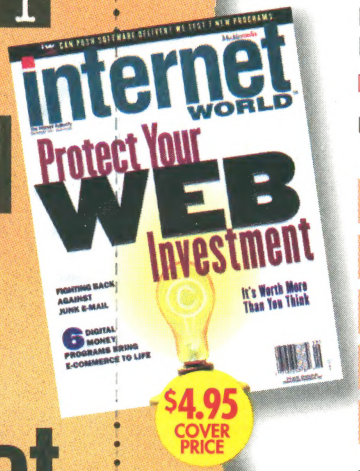
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